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A CATALOG OF THE FISHES KNOWN FROM THE WATERS OF KOREA

By DAVID STARR JORDAN and CHARLES WILLIAM METZ.

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CARNEGIE MUSEUM.

VOL. VI. NO. 1.

A CATALOG OF THE FISHES KNOWN FROM THE WATERS OF KOREA.

By David Starr Jordan and Charles William Metz.

(Plates I–X.)

In the summer of 1911 the senior author visited Korea, and with the aid of the authorities in charge of the fisheries made a considerable collection of the fishes of Korea (Chosen), especially of those obtainable at Fusan, and those seen in the markets at Seoul, the collection being in the interest of the Carnegie Museum of Pittsburgh, and of the Museum of Stanford University. Subsequently a still larger collection was brought together by Mr. B. Ihara, Commissioner of Fisheries for Chosen, and afterwards forwarded to the United States. This collection was made under the orders of General Terauchi, Governor General of Chosen, and of Mr. Yamagata, Vice-governor. A considerable number of fishes from Suigen (Suwon) was obtained by Dr. K. Honda, Director of the Agricultural Experiment Station located at that place, which is inland, about fifty miles southward of Seoul.

The localities represented in our collections are the following: Fusan, the port at the southern extremity of Korea; Chemulpo, the port of Seoul; Suigen, (in Japanese *Suwon*), on an inland stream, tributary to the River Han, about fifty miles south of Seoul; Heijo, near Pyeng-yang in northwestern Korea; and

Chinnampo, the port of Pyeng-yang. We have also included the species taken by Mr. Pierre Louis Jouy and described by Jordan and Snyder from the large island of Tsushima, which lies between Fusan and Shimonoseki. This island belongs politically to Japan, but geographically rather to Korea.

The marine fauna of these regions is fairly well known, but the record of the river-fauna is still very far from complete.

The synonymy of several species is uncertain, and the identity of some with Chinese species on the one hand or with Japanese forms on the other is still far from certain. Numerous genera and species recorded from the Amur River by Dybowsky and by Berg have yet to be compared with Korean forms. The most valuable work so far done on the fish-fauna of this region is that of Dr. Peter Schmidt and his colleague in the Museum of St. Petersburg, Dr. Leo S. Berg.

The present paper gives a list of all the species known to occur in Korea, or in the seas immediately adjoining. It includes the species of the present collection, as well as those in the Museum of St. Petersburg, collected by Herz and by Schmidt, described later in different papers by Dr. Solomon Herzenstein, Dr. Peter Schmidt, and Dr. Leo S. Berg. There are also included the species obtained for the United States National Museum by Pierre Louis Jouy at Gensan and Fusan, and those obtained at Port Arthur by Professor Francis James Abbott, and sent to Stanford University. While Port Arthur is outside of Korea, its fauna must be identical with that of the near-by ports of Chinnampo and Chemulpo in Korea. The collections of Jouy and Abbott have been described by Jordan and Starks in the Proceedings of the United States National Museum. We have further included the marine fishes mentioned by Basilewsky, in his *Ichthyographia Chinæ Borealis* (1855) from the gulf of Pechili about Tientsin. The species named in this work are very imperfectly described and some of them can only, if at all, be recognized by their Chinese names. Some species noted by Basilewsky are here described in detail for the first time. We include these, as there is apparently no real difference between the marine fauna at Tientsin and that on the opposite side of the Gulf at Port Arthur, Chinnampo, and Chemulpo. There seems to be very little difference between the fishes of the west shore and those of Fusan at the southern extremity of Korea. All these bays, Fusan, Chemulpo, and Chinnampo, have sandy bottoms, and are much frequented by flounders, soles, conger-eels, croakers, gobies, and other fishes of the sands. The market of Fusan forms a rather striking contrast to that of Shimonoseki, the nearest town on the Japanese side of the Straits of

Tsushima. At Shimonoseki many species frequenting rocks are taken. The fauna of Gensan on the northeastern coast of Korea beyond Gensan is apparently northern, approaching that of Saghalin. The subarctic fauna described by Schmidt and others from Saghalin, Vladivostok, and Peter the Great Bay, undoubtedly extends along the Korean shores as far as Gensan. In the present list we have not included any of these species, unless actually recorded from Korea. These northern forms are not closely related to the fauna of the temperate zone found in the waters of southern and western Korea.

Among the species enumerated from Fusan are some closely related to those on the Japanese shore, yet distinct from their nearest allies. The majority of the species are, however, of the ordinary Japanese types.

Dr. Jordan wishes to express his personal appreciation to General Terauchi, Governor General of Korea, and to Vice-governor Yamagata for assistance in this work. Governor Terauchi requested the co-operation of all the fishery inspectors. In this connection we desire to acknowledge the efforts of Mr. B. Ihara, Commissioner of Fisheries for Korea, Mr. T. Kikuchi, head of the Bureau of Education, Dr. K. Honda, Director of the Agricultural Experiment Station at Suwon, Mr. Eitaro Ijima of the Bureau of Finance at Seoul, a former student of the senior author, Mr. T. Wakamatsu, Governor of Fusan, and Mr. G. Yamaoka, collector of Customs at Fusan, who rendered especially valuable service.

The new drawings in this paper are the work of the late Sekko Shimada, and of Mrs. Herbert Charles Nash. The others are reprints from papers in the Proceedings of the United States National Museum. The vernacular names are given by Mr. Ihara. Unless otherwise specified they are the Japanese (not Korean) names.

Ten species are new: *Spirinchus verecundus, Rhodeus chosenicus, Pseudoperilampus hondæ, Parapelecus eigenmanni, Pseudaspius bergi, Pseudaspius modestus, Epinephelus ionthas, Sciæna iharæ, Pleurogrammus azonus, Sebastodes ijimæ, Areliscus hollandi.*

Family EPTATRETIDÆ.

1. Eptatretus burgeri (Girard).

Fusan[1] (Jouy coll.).

[1] Throughout this paper the use of the words *Fusan, Chinnampo, Chemulpo, Sûigen, Heijo,* without the citation of any other authority, indicates that specimens were seen or obtained at those localities by Dr. Jordan or by Mr. Ihara. (D. S. Jordan.)

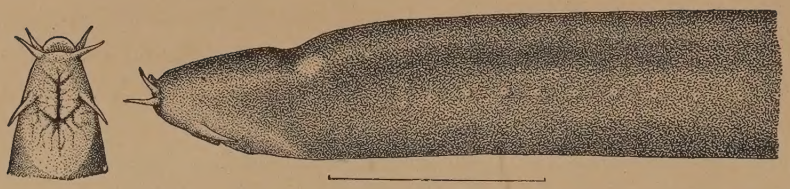


FIG. 1. *Eptatretus burgeri* (Girard). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIII, Plate XXX.)

Family HETERODONTIDÆ.

2. **Heterodontus japonicus** (Duméril). "Nekosame."
Fusan (No. 4491a).[1] (Jordan coll.)

Family GALEORHINIDÆ.

3. **Triakis scyllium** Müller & Henle. "Shirosame."
Fusan, Chinnampo (Nos. 4362a, 4490a).

4. **Cynias manazo** (Bleeker). "Hoshisame."
Jinsen (No. 4492a).

Family SPHYRNIDÆ.

5. **Sphyrna zygæna** (Linnæus). "Shimokusame."
Fusan (No. 4470a).

Family SQUALIDÆ.

6. **Squalus mitsukurii** Jordan & Fowler. "Tsunozame."
Chinnampo (No. 4359a).

FIG. 2. *Squalus mitsukurii* Jordan & Fowler. (Proc. U. S. N. M., Vol. XXVI, p. 630.)

7. **Squalus japonicus** Ishikawa.
Chinnampo.

This species is distinguished from the common dog-fish or "Tsunozame" of Japan (*Squalus mitsukurii*) by the sharper and less obtuse snout, and by the

[1] Numbers in brackets after a locality indicate that the specimens in the Carnegie Museum from that locality bear the numbers given. Numbers given after a list of localities indicate that the specimens may have come from the localities named, or that they may simply have attached to them the general locality-label "Korea." (All those thus labelled came from Fusan, according to Dr. Jordan.) (C. H. Eigenmann, *Curator*.)

difference in the insertion of the first dorsal spine. The dorsal in *Squalus mitsukurii* is a little nearer the tip of the snout than the second dorsal. In *Squalus japonicus* the first dorsal is midway between the tip of the snout and the second dorsal, the pectoral reaching it.

Family SQUATINIDÆ.

8. **Squatina japonica** Bleeker. "Korosame."
Fusan (No. 4472a).

Family RHINOBATIDÆ.

9. **Rhinobatus schlegeli** Müller & Henle. "Sagatazame."
Fusan (No. 4476a).

Family RAJIDÆ.

10. **Raja kenojei** Müller & Henle. "Gangiei."
Port Arthur (Abbott). This is apparently *Raja chinensis* Basilewsky (*Ichthyographia Chinæ Borealis*, 1855, p. 251, from off Peking).

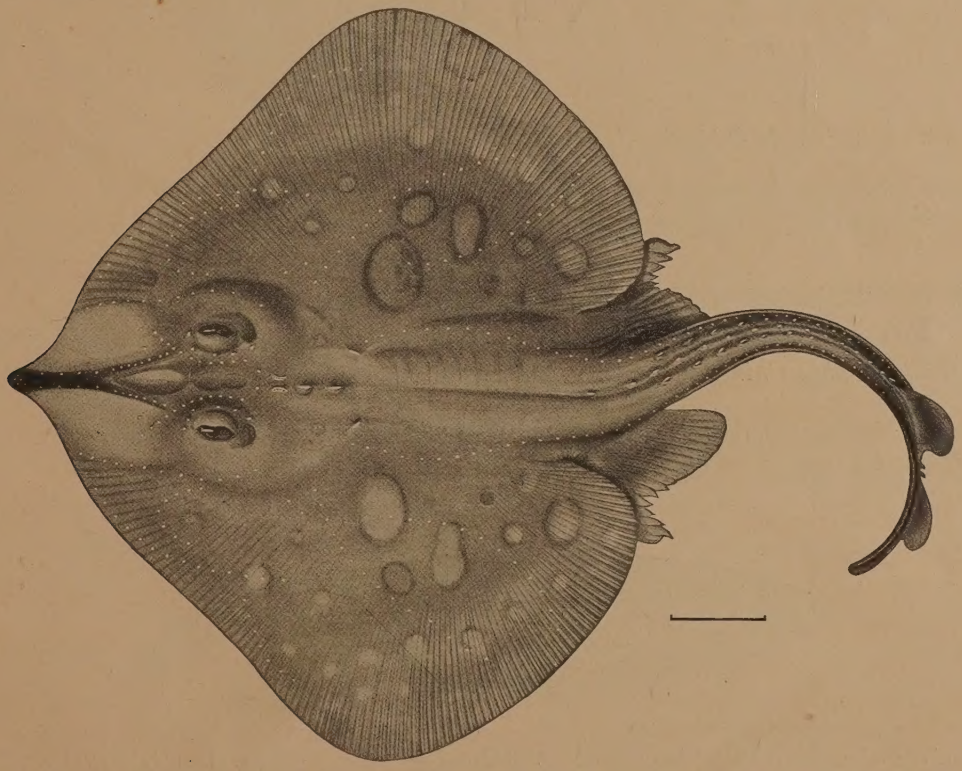


FIG. 3. *Raja meerdervoorti* Bleeker. (After Jordan & Fowler, Proc. U. S. N. M., Vol. XXVI, p. 651.)

11. **Raja meerdervoortii** Bleeker. "Gangiei."
Fusan (No. 4471a).

Family DASYATIDÆ.

12. **Urolophus fuscus** Garman. "Shiroei."
Fusan (No. 4474a).

13. **Dasyatis akajei** (Schlegel). "Akaei."
Fusan (No. 4477a).

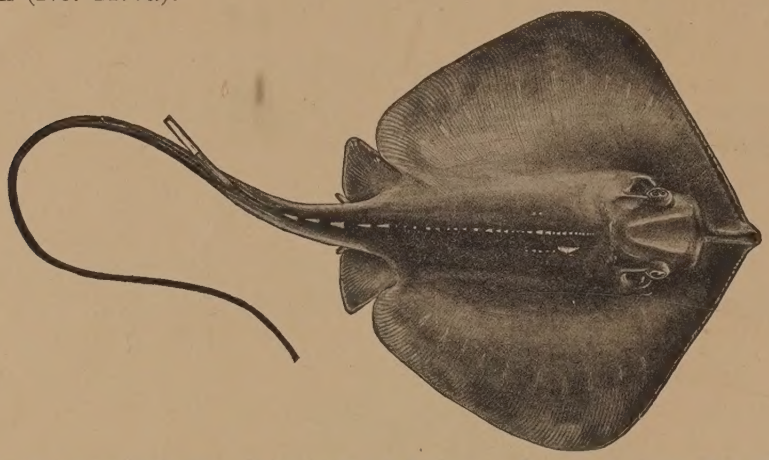


FIG. 4. *Dasyatis akajei* (Schlegel). (After Jordan & Evermann, Proc. U. S. N. M., Vol. XXV, p. 319.)

14. **Pteroplatea japonica** Temminck & Schlegel. "Yokosaei."
Fusan (No. 4475a).

Family MYLIOBATIDÆ.

15. **Myliobatis tobijei** Bleeker. "Tobiei, Hatoei."
Fusan (No. 4473a). This is apparently Basilewsky's *Myliobatis rhombus* (*Ichthyographia Chinæ Borealis*, p. 250) from the sea about Tientsin.

Family CLUPEIDÆ.

16. **Clupea pallasi** Cuvier & Valenciennes. "Nishin."

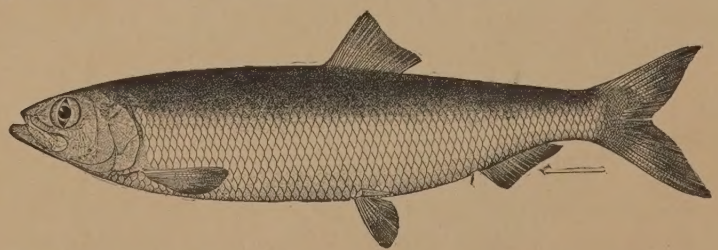


FIG. 5. *Clupea pallasi* Cuvier & Valenciennes. (After Jordan & Herre, Proc. U. S. N. M., Vol. XXXI, p. 631.)

Seen in Fusan. Also from Chinnampo (Nos. 4102a–e; 4130a). This is apparently *Clupea inermis* Basilewsky (p. 242) from about Tientsin.

17. **Amblygaster melanostictum** (Temminck & Schlegel). "Iwashi."
Fusan.

18. **Sardinella zunasi** (Temminck & Schlegel). "Zunashi."
Fusan, Chinnampo (Nos. 4228a–l).

19. **Ilisha elongata** (Bennett). "Hira."
Fusan, rather common (No. 4487a–b).

20. **Etrumeus micropus** (Temminck & Schlegel). "Urumeiwashi" adult; "Tsunashi" young.
Fusan, Jinsen; common (No. 4539a–j).

ZUNASIA gen. nov.

The species described by Basilewsky under the name of *Pristigaster chinensis* has not been noted by any subsequent author. It is the type of a new genus, *Zunasia* Jordan & Metz, allied to *Pristigaster*, but differing in the form of the body, the belly not forming the gibbous arc of a circle, being only moderately curved. The dorsal, as in *Pristigaster*, is inserted before the anal, near the middle of the body. The ventrals are wanting, as in *Pristigaster* and *Opisthopterus*. The type of *Pristigaster* is *P. cayanus* from Guiana and northern Brazil. No second species of *Pristigaster* is known.

The name *Zunasia* is derived from "Zunashi," the vernacular name of the related *Sardinella zunasi*.

21. **Zunasia chinensis** (Basilewsky). (Plate I, fig. 1.)
Pristigaster chinensis Basilewsky, *Ichthyographia Chinæ Borealis*, 1855, p. 243. (Gulf of Pechili.)

The following description of *Zunasia chinensis* Basilewsky is founded upon three specimens from 4.5 to 5.5 inches long, taken at Chinnampo, Korea, and cataloged in the Carnegie Museum under No. 4569:

D. 17 to 18; A. 48; scutes in front of vent 36; depth 3.66; head 4.5; eye 3 in head; snout 3.5; interorbital 7.5; maxillary 2.33. Body elongate, rather slender, greatly compressed, deepest behind apex of pectoral. Dorsal outline a gentle, even curve from nape to caudal; ventral outline more convex. Belly from gill-openings to vent slightly (not greatly) arched, the depth of the convexity being much less than the diameter of the eye, armed with thirty-six

sharp scutes. Head compressed, lower jaw large, projecting, entering dorsal profile, which is straight to nape, then rises in a gentle curve; occipital region with a long narrow, V-shaped groove, the two bounding ridges of which unite before the eye. Mouth terminal, moderate, very oblique; maxillary reaching beyond anterior margin of pupil; premaxillary distinct, fixed; teeth extremely minute, villiform in both jaws; gill-rakers numerous, long, slender; eye large, elevated, upper edge of pupil on a level with the apex of the mandible. Scales deciduous, rubbed off of our specimens, probably about sixty in number.

Dorsal short, inserted midway between the tip of the snout and the base of the caudal; anal long, inserted under the posterior third of the dorsal, extending to a point within diameter of eye from origin of caudal; caudal deeply forked, apparently not filamentous; pectorals small; ventrals wanting.

Color dusky brown above, silvery below; all fins pale; caudal with traces of black on marginal rays.

Family DOROSOMATIDÆ.

22. **Konosirus punctatus** (Temminck & Schlegel). "Konoshiro."
Fusan (No. 4527a–l).

23. **Konosirus nasus** (Bloch).
Chinnampo (No. 4227a).

Family ENGRAULIDÆ.

24. **Engraulis japonicus** Temminck & Schlegel.
Fusan.

25. **Setipinna gilberti** Jordan & Starks.
Fusan; very common.

26. **Trichosoma hamiltoni** (Gray).
Fusan, Chinnampo. (No. 4528, thirty specimens from Fusan, all marked "Korea.") (No. 4133a–e.)

27. **Coilia nasus** Temminck & Schlegel. "Etsu."
Port Arthur (Abbott); Chinnampo (No. 4137a).

28. **Coilia ectenes** Jordan & Seale. "Etsu."
Fusan, Chemulpo (No. 4515a–b).

This species differs from *Coilia nasus* of Southern Japan in the much larger number of fin-rays (123 instead of 81 in the anal). The number of dorsal

rays in the original description (113) is a misprint. The species is common on the sandy shores at Fusan and Chemulpo.

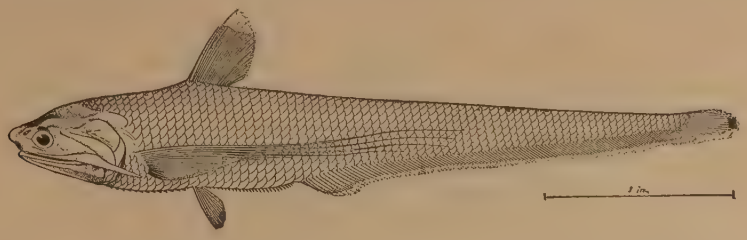


FIG. 6. *Coilia ectenes* Jordan & Seale. (Proc. U. S. N. M., Vol. XXIX, p. 518.)

Family SALMONIDÆ.

29. **Oncorhynchus masou** Brevoort. "Masu."
Chinnampo (No. 4355a).

30. **Oncorhynchus gorbuscha** (Walbaum).
Korea (Berg).

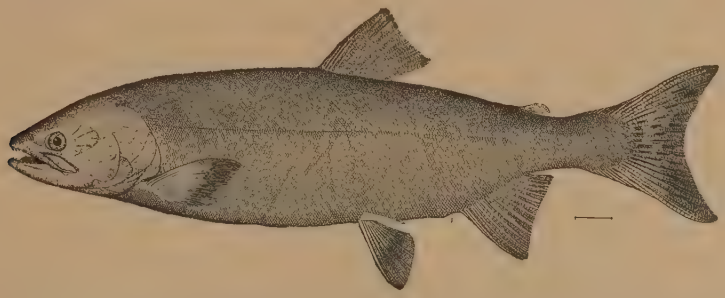


FIG. 7. *Oncorhynchus gorbuscha* (Walbaum). (After Jordan & Evermann, Bull. U. S. N. M., 47, Pt. IV, Plate 77, fig. 205.)

31. **Oncorhynchus keta** (Walbaum). "Sake."
Korea (Berg).

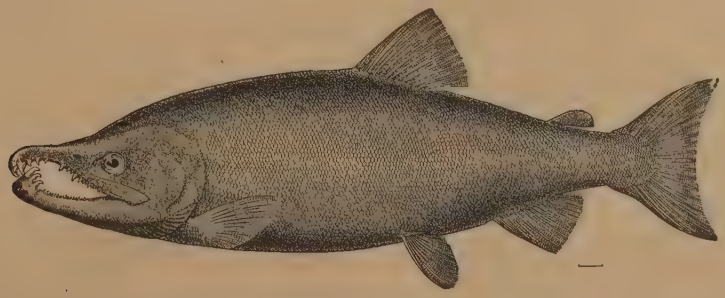


FIG. 8. *Oncorhynchus keta* (Walbaum). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIV, p. 573.)

32. **Plecoglossus altivelis** Temminck & Schlegel. "Ayu."
Tsushima, Fusan (No. 4541a–c), Seoul, Yalu River.

Fig. 9. *Plecoglossus altivelis* Temminck & Schlegel. (After Jordan & Evermann, Proc. U. S. N. M., Vol. XXV, p. 328.)

The common Ayu is very abundant in all the rivers of Korea, including the Yalu. Our specimens are from Fusan, and unusually large. It has not been hitherto definitely recorded from the continent of Asia, and the limits of its range are not known.

Family ARGENTINIDÆ.

33. **Osmerus dentex** Steindachner.
Chinnampo (No. 4225a–b).

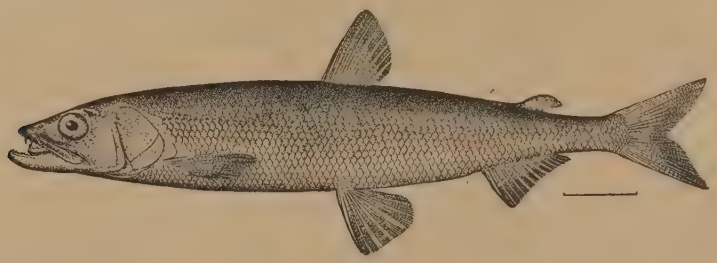


Fig. 10. *Osmerus dentex* Steindachner. (After Jordan & Evermann, Bull. U. S. N. M., No. 47, Pl. LXXXVI, fig. 229.)

Dr. Berg (*Ichthyologia Amurensis*, p. 58) places *Salmo inghaghitsh* of Walbaum (Artedi Piscium, p. 73) as a doubtful synonym of *Osmerus dentex*. As the teeth are said to be very small ("dentes minimi") it is not likely that this can be an *Osmerus*. It can only be *Mesopus olidus*, which according to Pallas is called "Inniacha" in Kamchatka. In that case the latter species should stand as *Mesopus inghaghitsh*.

34. **Spirinchus verecundus** sp. nov. (Plate I, fig. 2.)

Type No. 4570, 5.75 inches, Chinnampo, Korea; cotype, No. 4097.

Allied to *Osmerus* or *Spirinchus thaleichthys* Ayres, from the coast of California.

D. 10; A. 13; V. 8; scales 6–64; depth 5.6; head 5.5; eye 3.66 in head; snout 3.66; interorbital 3.66; maxillary 2.5; number of branchiostegals 7; gill-rakers numerous, slender, about 12–24; lateral line median. Teeth on vomer, palatines, and tongue moderate, canine-like, none of them very large, those on jaws very minute. Body slender, compressed, long; dorsal and ventral outlines similar; head rather stout, flat on top; snout bluntly pointed; lower jaw slightly projecting; mouth rather large; maxillary reaching pupil; eye moderate, elevated, nearer tip of snout than gill-opening. Scales rather small, cycloid, none on head.

Dorsal short, rather high, inserted midway between tip of snout and base of caudal; third ray longest, 1.33 in head; distance between insertion of dorsal and adipose dorsal exactly one-third the length of the body; caudal deeply emarginate; pectoral moderate, 1.33 in head, reaching slightly over half-way to ventrals; ventrals inserted under anterior third of dorsal, reaching half-way to anal; anal short, inserted two-thirds of its length before adipose dorsal.

Color dusky above, darkest on back and in a stripe along lateral line; under parts and all fins pale.

Described from three specimens 5.75 inches in total length, taken at Chinnampo, Korea. The type is Number 4570 in the Carnegie Museum. A cotype is in the collection of Stanford University.

Family SALANGIDÆ.

35. **Salanx hyalocranius** Abbott. "Shirano."

Chinnampo, River Kanko, near Fusan (No. 4253a–d and 4524a–g). Otherwise known only from about Tientsin. Locally abundant. This species is *Eperlanus chinensis* of Basilewsky (*Ichthyographia Chinæ Borealis*, 1855, p. 242), but the name *chinensis* is preoccupied in *Salanx*, for the "Whitebait" of Southern China.

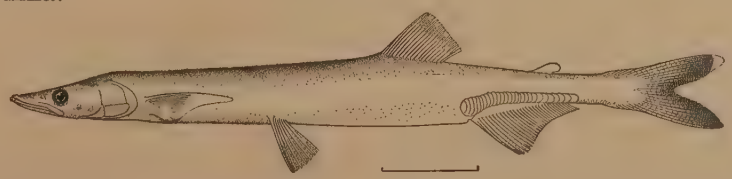


FIG. 11. *Salanx hyalocranius* Abbott. (Proc. U. S. N. M., Vol. XXIII, p. 491.)

Family SYNODONTIDÆ.

36. **Saurida eso** Jordan & Herre. "Eso."
Fusan; common in the markets (No. 4557a).

FIG. 12. *Saurida eso* Jordan & Herre. (Proc. U. S. N. M., Vol. XXXII, p. 520.)

Family SILURIDÆ.

37. **Parasilurus asotus** (Linnæus). "Namazu" (Korean name "Chyagasari").
Han River at Seoul, Kanko River (No. 4529a–c); Heijo, Suigen (No. 4361a).

FIG. 13. *Parasilurus asotus* (Linnæus). (After Jordan & Evermann, Proc. U. S. N. M., Vol. XXV, p. 320.)

38. **Fluvidraco fulvidraco** (Richardson). (Korean name "Chyagasari.")
Silurus calvarius Basilewsky.
Seoul (Steindachner); Suigen (No. 4343a).

39. **Leiocassis longirostris** (Günther).
Han River, Seoul (Steindachner).

Family COBITIDÆ.

40. **Cobitis sinensis** Sauvage. "Shimadozo" (Korean name "Chigorunchen").
Suigen, Gensan (No. 4148a); Fusan (Jouy); Pungtung (Herz).

41. **Lefua costata** Kessler.
Elxis coreanus Jordan & Starks, Proc. U. S. Nat. Mus., Vol. XXVIII, 1905, p. 201.

Gensan, Fusan (Jouy); Gensan (Schmidt); Chinnampo (No. 4177, 145 specimens).

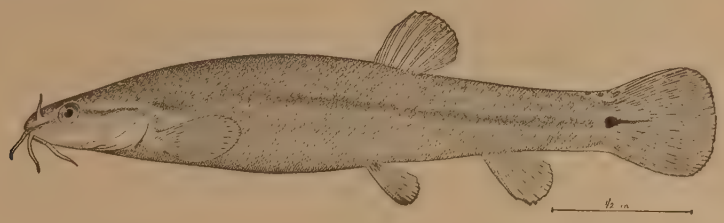


FIG. 14. *Lefua costata* Kessler. (After Jordan & Starks, Proc. U. S. N. M., Vol. XXVIII, p. 202.)

This species seems locally very abundant.

42. **Oreias toni** (Dybowsky).

Pung-tung (Herz).

Description taken from ten specimens 2.5–4.5 inches long, collected at Chinnampo, Korea (No. 4142a–k):

D. 9; A. 7; pores in lateral line about 95; head in length 4.8; depth 8.5; depth of caudal peduncle in head 1.25; eye 6; snout 2.33; interorbital 4.25; pectoral 1.60. Barbels six, four of them close together on snout, one on apex of each maxillary; nostrils small near eye, anterior with a flap; scales small, imbedded, not imbricated, apparently lacking on head; lateral line median; gill-openings confined to sides, not extending forward, separated by broad isthmus. Body long, slender, not compressed, uniform in depth from shoulder to vent; caudal peduncle compressed, its width at base 1.66 in its depth; head long, slightly compressed, conical, tapering to the bluntly rounded, projecting snout; mouth inferior, small; maxillary reaching to below anterior nostril, not nearly to eye; all barbels long, about equal to snout; eye small, elevated, about midway in length of head.

Dorsal short, rather high, apex rounded, inserted nearer the tip of the snout than the base of the caudal by a distance equal to length of snout; caudal very slightly emarginate; pectorals short, rounded; ventrals inserted very slightly in front of dorsal, not reaching vent; anal short, high, inserted well behind vertical from tip of depressed dorsal, half the length of head behind the last dorsal ray.

Color in spirits dusky above lateral line, irregularly blotched with darker areas, most of which are much larger than eye; sides below lateral line lighter, with indistinct blotches; ventral surface white. Top of head dark, with irregular light specks; sides of head mottled and freckled, with a dark stripe from eye to tip of snout. Dorsal spotted, the spots forming four irregular bars;

caudal similar, the spots scarcely arranged in bars; pectoral mottled apically, the spots in two irregular bars. A series of ten specimens shows great variation in color; the blotches on the upper parts of some specimens arranged in zigzag, transverse bars, extending well down on the sides below the lateral line; others are pale, with large distinct, round blotches on back and sides.

According to Dr. Berg, *Oreias dabryi* Sauvage (Revue & Mag. Zool., XXXVIII, 1874, p. 334) from China is generically identical with *Orthrias* Jordan and Fowler (*O. oreas*) of later date. Dr. Berg regards *Oreias* as a subgenus of *Nemachilus*, from which it is separated by the short dorsal and subtruncate caudal.

43. **Misgurnus anguillicaudatus** (Cantor). "Dojo" (Korean name "Mikkukurru").

FIG. 15. *Misgurnus anguillicaudatus* (Cantor). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXX, p. 834.)

Kanko River (No. 4518a–j), Fusan; everywhere common. Chinnampo, Suigen (No. 4205a–j), Heijo.

According to Dr. Berg, *Misgurnus decemcirrosus* Basilewsky is not distinct from this species, as Jordan & Snyder have supposed.

Family CYPRINIDÆ.

44. **Cyprinus carpio** Linnæus. "Koi" (Korean name "Ing-o").
Korea, common everywhere (Nos. 4526a–c, 4556a–c).

45. **Carassius auratus** (Linnæus). "Funa" (Korean name "Ping-o").
Everywhere in the rivers (No. 4340a–d, 4364a).

46. **Hemibarbus maculatus** Bleeker.
Hemibarbus maculatus Bleeker, Verh. Akad. Amst., XII, 1871, p. 19, taf. IV, fig. 8. Yangtsekiang.
Barbus semibarbus Günther, Ann. & Mag. Nat. Hist., 1889, p. 224 (substitute for *maculatus*, preoccupied in *Barbus*).

Hemibarbus joiteni Jordan & Starks, Smithsonian Miscellaneous Collections, XLV, 1904, plate LXIV; Tientsin.

Acanthogobio paltschevskii, Nicolsky, Ann. Mus. Zool. Petersb., VIII, 1904, p. 356. Ussuri River, Chanka Lake.

Heijo (No. 4186a–b).

Three specimens from Heijo, Korea, yield the following notes:

D. III, 7; A. 8; scales 8–50; depth 4.6; head 3.6; eye 4; snout 2.25; maxillary 3.11; interorbital 4.25 in head. Body slender, deepest under first dorsal spine; dorsal outline gently rounded, convex from snout to dorsal, thence sloping rapidly to posterior part of dorsal and then very gradually to caudal; ventral outline almost straight from snout to ventrals, thence sloping to caudal; dorsal inserted above tip of pectoral, well before ventrals; ventrals reaching half-way to anal; anal high, but not reaching caudal when depressed. Mouth inferior; snout projecting slightly above; barbels on maxillary slightly less than diameter of eye.

Dorsal very high, third spine equal to depth of body; last soft ray two-fifths length of first, which is equal to third spine; caudal emarginate; ventrals and pectorals narrow, pointed; dorsal pale with dark tip; caudal dusky, darker mesially; remaining fins pale. Body pale below lateral line, dusky above; all scales on back and sides above the level of the pectoral dark-edged, producing a lattice-work effect.

This species is close to *Hemibarbus barbus* (Schlegel) from Japan, but is certainly distinct. Dr. Berg identified *Hemibarbus barbus* with *Hemibarbus labeo* (Pallas) from Siberia. On this question we have no opinion. We have seen no specimens of *Hemibarbus barbus* from outside of Japan.

47. **Hemibarbus labeo** (Pallas).

Seoul (Steindachner) as *Barbus schlegeli;* Fusan (Berg).

We have not seen this species, and do not know whether it is identical with either the Japanese *Hemibarbus barbus*, or the Chinese *Hemibarbus maculatus*.

48. **Pseudogobio esocinus** Temminck & Schlegel.

Chinampo (No. 4136a).

We refer our specimens to this common Japanese species. The snout in Korean examples is somewhat shorter, and the lips a little less papillose, but we find nothing to warrant specific distinction.

49. **Pseudogobio rivularis** (Basilewsky).

Pseudogobio sinensis Kner.

This species from about Tientsin is close to *Pseudogobio esocinus*. A small specimen (No. 4310a) from Suigen may belong to it.

50. **Gnathopogon**[3] **coreanus** (Berg).

Sambusan River, South Korea (Berg).

51. **Pseudorasbora parva** Temminck & Schlegel.

(Korean name "Torukoki.")

Description based upon six specimens, the largest three inches in length, taken at Suigen, Korea:

D. 9; A. 8; scales 6–38; depth in length 4.33; head 4.25; depth of caudal peduncle in head 2; eye 3.5; snout 3; maxillary 4; interorbital 3.33; pectoral 1.5; pharyngeal teeth 5, in a single row, long, slender; gill-openings extending a short distance forward below; separated by a narrow isthmus; lateral line complete; slightly decurved. Body elongate, moderately deep, deepest at insertion of dorsal; back elevated from nape to dorsal descending rapidly under dorsal fin; ventral outline evenly slightly convex from snout to anal, then slightly concave; caudal peduncle compressed, rather slender; head broad, depressed, flattened above; snout pointed; mouth very short, broad, oblique; lower jaw slightly projecting; nostrils close together near eye; maxillary short, not reaching to below nostrils, scarcely half-way to eye; scales large, cycloid, lacking on head.

Dorsal short, high, inserted midway between snout and caudal at apex of back; longest rays equal to length of head; caudal deeply forked; pectoral short; narrowly rounded; apex falling short of ventral base by a distance equal to diameter of eye; ventrals inserted under second dorsal ray, short, not reaching anal, which is inserted behind last dorsal ray a distance equal to two-fifths of head, and reaches about half-way to the base of the caudal when depressed.

Color on top of head and back dark; scales on sides above level of pectorals each with a large, vertical, crescentic area of dusky, producing a spotted effect; a dark band, equal in width to the diameter of the eye, extends from tip of snout through eye to base of caudal; under parts and all fins pale.

This species is not distinguishable from *Pseudorasbora parva*, the common "Moroko" of the rivers of Japan.

52. **Gonoprokopterus mylodon** (Berg).

(*Barbus mylodon* Berg, 1907.)

Keumsan near Fusan (Berg).

[3] *Gnathopogon* Bleeker. Ichth. Archipel. Indic. Prodr., II, 1860, p. 434: type *Capocta elongata* Schlegel = *Leucogobio güntheri* Ishikawa.

53. **Ladislavia taczanowskii** Dybowsky.
Pung-tung (Herz).

54. **Saurogobio athymius** (Jordan & Starks).

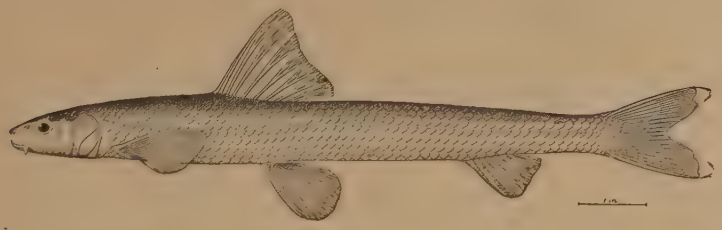


Fig. 16. *Saurogobio athymius* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVIII, p. 196.)

Chemulpo (Jouy).

Dr. Berg is quite right in considering the genus *Longurio* based by Jordan and Starks on this species, as identical with *Saurogobio* Bleeker, based on *S. dumerili* Bleeker from China.

55. **Coreius cetopsis** (Kner).
Chemulpo (Jouy).

56. **Pungtungia herzi** Herzenstein.
Pung-tung (Herz).

The genus *Pungtungia* obviously differs from *Pseudorasbora* in the presence of well-developed barbels. It differs from *Gnathapogon* (=*Squalidus* Dybowsky), in the low, produced snout and short oblique mouth; teeth 5–4; scales 40.

57. **Aphyocypris ensarca** (Jordan & Starks).
Fusan (Jordan & Starks).

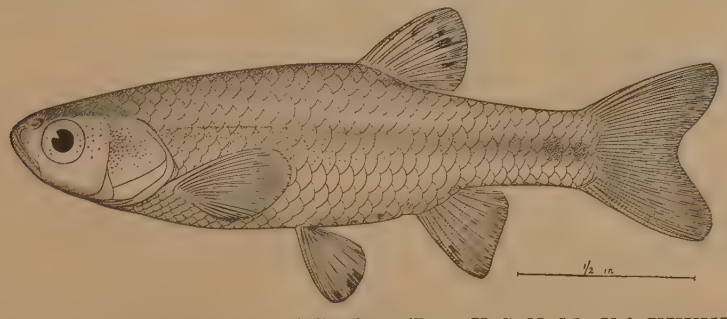


Fig. 17. *Aphyocypris ensarca* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVIII, p. 199.)

Dr. Berg is quite right in uniting the genus *Fusania*, established by Jordan and Starks for this species, with *Aphyocypris*, based by Dr. Günther on *A. chinensis*.

58. **Richardsonius hakuensis** (Günther). "Ugiu."

Kanko River, Fusan, Chinnampo (No. 4360a–c) (No. 4514a–c). Abundant.

Breeding males with two rather narrow orange stripes on each side from head to tail, one along the back and one along the side of the belly. Since, according to Professor Cockerell, none of the American or Japanese species usually referred to *Leuciscus* are congeneric with the European dace, *Leuciscus leuciscus* (Linnæus), we adopt for the group the oldest of the American names. The scales of *Richardsonius* are said to differ materially from those of *Leuciscus*.

59. **Richardsonius brandti** (Dybowsky).

Chinnampo (No. 4110), Gensan (Jordan & Starks, as *L. taczanowskii*). According to Dr. Berg *brandti* and *taczanowskii* are identical.

60. **Richardsonius semotilus** (Jordan & Starks).

Fusan (Jouy); Gensan (Schmidt).

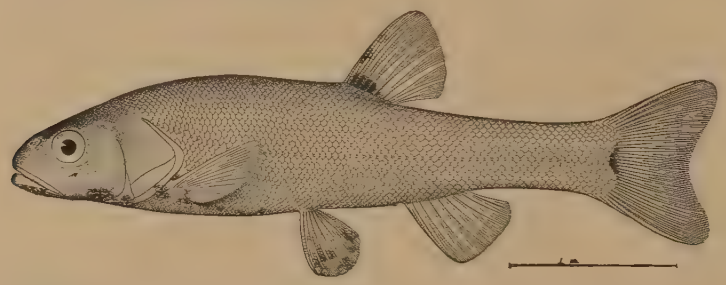


Fig. 18. *Richardsonius semotilus* (Jordan & Starks). (Proc. U. S. N. M., Vol. XXVIII, p. 200.)

61. **Richardsonius jouyi** Jordan & Snyder.

(*Leuciscus dorobaë* Ishikawa.)

Sasuma, island of Tsushima.

62. **Hemitremia lagowskyi** (Dybowsky).

Gensan (Schmidt).

According to Professor Cockerell the scales of the European species of *Phoxinus* differ generically from those of the East Asian and American forms referred to *Phoxinus*. We therefore use the name *Hemitremia* for the American and Japanese forms.

63. **Acheilognathus coreanus** Steindachner.

Seoul (Steindachner).

64. **Acheilognathus signifer** Berg.

Pung-tung (Herz).

65. **Acanthorhodeus asmussi** Berg. (Plate II, fig. 1.)

Jeijo. (Korean name "Nazegi.")

A fine large specimen of this handsome genus (No. 4571) obtained at Heijo we refer with some doubt to *Acanthorhodeus asmussi* (Dybowsky) (Verh. Zool.-Bot. Ges., Wien, XXII, 1872, p. 212, Chanka Lake), as noted by Berg in his *Ichthyologia Amurensis*.

Description of two specimens 5.5 inches in total length, taken at Heijo, Korea: D. II, 18; A. II, 13; depth 2.25; head 4.5; eye 3.5; snout 3.5; maxillary 4; interorbital 2.5; scales 7, 40, 6. Maxillary with very small rudimentary barbel at tip; lateral line complete, decurved, slightly below median line; pharyngeal teeth 5–5, sharp, curved and claw-like; body deep, compressed, deepest through origin of dorsal; ventral outline evenly curved from snout to caudal peduncle, less strongly arched than dorsal outline, which is very high; head low; profile from tip of snout to nape almost straight; nape high; snout blunt; eye large, elevated; mouth small, inferior; maxillary not reaching front of eye; nostrils large, very closely approximated, and near eye.

Scales very large on sides, smaller below; head naked; dorsal and anal with sheath of large scales at base, none on membrane; dorsal fin long, not high, inserted midway between tip of snout and base of caudal; first two rays spine-like, second longest, 1.16 in head; dorsal rays gradually shortened to last which is 2.33 to 3 in first; anal similar to dorsal, inserted under tenth dorsal ray; second ray spine-like, as large as second dorsal ray; caudal emarginate; pectorals and ventrals small, the former not quite reaching the latter, which are inserted slightly in advance of dorsal and reach almost to anal.

Color dusky above, black on top of head and median line of back; paler below, white on ventral parts; scales above level of pectoral dark-edged; a black band from base of tail along middle of side, becoming narrower and elevated anteriorly, ending in a distinct black blotch, slightly larger than pupil, a short distance behind opercle; all fins pale; dorsal with traces of dusky longitudinal bars; caudal with a few irregular jet-black spots.

This species is somewhat similar to *Acanthorhodeus guichenoti* Bleeker, but is more slender and has longer spine-like rays in dorsal and anal, and conspicuous black markings which are lacking in the latter.

66. **Rhodeus chosenicus** sp. nov. (Plate II, fig. 2.) (Korean name "Sogusari.")

Type, No. 4567 and cotypes 4568a–b, the largest 1.84 in. Suigen, Korea.

D. 8; A. 8; scales 30; depth 4; head 3.8 in length; eye 3.66 in head; snout 3.8; interorbital 2.8; pharyngeal teeth in one row 5–5, sharp, claw-like; gill-

rakers sparse, short; lateral line short, descending, incomplete; body elongate, not greatly compressed, slender, deepest through middle of pectorals; dorsal and ventral outlines similar; head depressed, broad, flattened on top; snout bluntly pointed; mouth terminal, oblique; maxillary reaching eye, which is large, slightly elevated; dorsal inserted nearer base of caudal than tip of snout by half the length of head, short, high; longest ray 1.33 in head; caudal deeply forked; pectoral short, not reaching ventrals, which are inserted slightly before dorsal and extend to vent; anal short, high, inserted behind last dorsal ray; longest ray equal to length of ventrals, reaching half-way to caudal when depressed; caudal peduncle almost as long as head, uniform in depth, which is half its length; scales cycloid, scarcely smaller on belly.

Color in spirits dusky on upper parts, black on top of head and median line of back, lighter below; scales on middle of sides with dusky patches, faint indication of posterior lateral stripe in some specimens; fins all pale.

Described from six specimens, the type largest, 1.84 inches in total length, taken at Suigen, Korea. The type is number 4567 Carnegie Museum; a cotype is in the Stanford University collection.

67. **Rhodeus ocellatus** Günther. (Korean name "Nazegi.")

Suigen, four specimens (No. 4299a–c).

This little fish is in color almost exactly like *Acanthorhodeus asmussi*, but there is a black spot behind the shoulder, besides a long blue stripe along the caudal peduncle. It agrees fully with the original description, and its form and color are well shown in Bleeker's figure. (See *Cyprinoides de Chine*, p. 34, pl. VI, fig. 3.)

68. **Pseudoperilampus hondæ** sp. nov. (Plate II, fig. 3.)

Type No. 4566, 2 inches, Suigen, Korea.

D. III, 13; A. III, 11; scales 7–35; depth 2.8; head 3.8; eye 3.2; snout 4.5; interorbital 3.5; depth caudal peduncle 2.5; maxillary 4; peritoneum black; pharyngeal teeth 5–5, one-rowed, sharp, serrate.

Body moderately deep, greatest depth at origin of dorsal; dorsal and ventral outlines equally convex; anterior profile arched above pectorals, straight from nape to tip of snout; origin of dorsal slightly nearer tip of snout than caudal base; pectorals slender, reaching ventrals; ventrals inserted under first dorsal spine, reaching anal; dorsal fin rather high, longest ray 1.16 in head; anal inserted under sixth dorsal ray, similar to soft dorsal; caudal deeply forked; lateral line slightly below middle of side.

Color dusky on back, becoming lighter on middle of sides and white below; scales on upper parts dark-margined; dorsal and anal each with three narrow, black, longitudinal stripes, separated by similar pale stripes; caudal slightly dusky; other fins pale.

This species differs from *Pseudoperilampus typus* in the much larger scales, and the longer vertical fins.

Described from the type 2 inches in total length, taken at Suigen, Korea number 4566 in the Carnegie Museum.

Named for Dr. K. Honda, the director of the Agricultural Station at Suigen, who obtained for us a fine collection from the pond at this station.

69. **Opsariichthys bidens** Günther. (Korean name "Woi.")

Heijo (No. 4533a) (No. 4232a), Suigen; Seoul (Steindachner).

This species seems very close to the Japanese representative *O. uncirostris* (Temminck and Schlegel).

70. **Zacco temmincki** (Temminck & Schlegel).

Fusan (Jouy); Pung-tung (Herz).

71. **Squaliobarbus curriculus** (Richardson).

Seoul (Steindachner).

72. **Parapelecus jouyi** Jordan & Starks.

Chemulpo (Jouy).

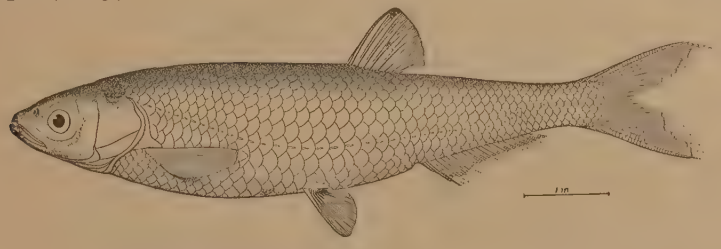


FIG. 19. *Parapelecus jouyi* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVIII, p. 201.)

73. **Parapelecus eigenmanni** sp. nov. (Plate III, fig. 1.)

Type No. 4565, 5.5 inches, Suigen, Korea.

D. 9; A. 15; scales in median series about 50; depth 4 in length; head 4.5; eye 4 in head; snout 4; interorbital 3; maxillary 3; pectoral 1; depth of caudal peduncle 2.5. Lateral line very low, with an abrupt anterior arch; body elongate, compressed, deepest in front of ventrals; back slightly elevated; ventral outline much more convex than dorsal; head broad, almost flat on top; dorsal

profile of head straight; snout high; mouth rather small, terminal, oblique; lower jaw included; maxillary reaching vertical from nostrils, not to eye; nostrils large, elevated, separated by a flap, nearer eye than tip of snout; eye large, slightly elevated, not entering profile; belly trenchant from below pectorals to vent, arched before and behind ventrals.

Dorsal fin inserted nearer base of caudal than tip of snout by a distance equal to half the head; first soft ray slightly longer than spine-like ray, almost equal to length of head; caudal deeply forked; lower lobe slightly the longer; pectoral long, pointed; first ray longest, reaching four-fifths distance to ventrals, which are inserted half their length before dorsal, and extend half way to anal; anal rather long and low; first rays twice the length of last, inserted under apex of depressed dorsal.

Color in spirits entirely pale, slightly dusky above; all fins pale.

Described from type and cotype, the former 5.5, the latter 3.75 inches in total length. The type was taken at Suigen, Korea, and is No. 4565 in the Catalog of the Carnegie Museum. It is named for Prof. C. H. Eigenmann.

74. **Pseudaspius bergi** sp. nov. (Plate III, fig. 2.)

Type No. 4563, 4 inches, cotypes 4091. Chinnampo, Korea.

D. 9; A. 8; scales 100 to 120 in lateral line, 53 to 60 before dorsal; head in length 4; depth 5; eye in head 4; maxillary 3; snout 3.66; interorbital 2.75; depth of caudal peduncle 2. Lateral line low, decurved, following ventral outline posterior to ventrals; body long, slender, not greatly compressed, dorsal and ventral outlines similar; caudal peduncle deep, compressed; head broad, depressed, flattened above, tapering to rather acute snout; no barbels; mouth rather large, oblique, terminal; maxillary reaching eye, nostrils close together, nearer eye than tip of snout; eye rather large, high; interorbital space broad, very slightly convex. Pharyngeal teeth two-rowed, 4, 2, 2, 4, the outer ones long, fang-like, curved at tips; gill-rakers rudimentary, gill-openings almost confluent, the isthmus very narrow; scales moderate, cycloid.

Dorsal inserted posteriorly, nearer base of caudal than tip of snout by a distance equal to half of head, rather high; longest ray 1.33 in head; caudal emarginate; pectorals small, rounded, 1.66 in head; reaching a trifle more than half-way to ventrals, which are inserted one-half their length before dorsal, and reach almost to anal; anal short, high, inserted just behind dorsal base, reaching half-way to caudal.

Color in spirits dusky, almost black on upper parts, pale on belly; dorsal, caudal, and tips of pectorals dark; other fins pale.

Described from six specimens, the type 4 inches, the rest 2.5 to 4 inches in total length, from Chinnampo, Korea. The type is number 4563 in the Catalog of the Carnegie Museum; a cotype is in the collection of Stanford University.

The genus, *Pseudaspius*, is visibly distinguished from other Korean minnows by the very small scales. It resembles the American genus *Rhinichthys*, but has no barbels.

Pseudaspius bergi is a strongly marked species, well separated from *Pseudaspius leptocephalus* (Pallas) from the Amur River. It is named for Dr. Leo S. Berg of the Museum at St. Petersburg, in recognition of his admirable "Ichthyologia Amurensis."

75. **Pseudaspius modestus** sp. nov. (Plate III, fig. 3.)

Type No. 4561, 2 inches; cotypes No. 4562. Chinnampo, Korea.

D. 9; A. 9; scales in lateral line about 82; head in length 3.5; depth 4.5; eye in head 3.66; snout 3.5; maxillary 3.25; interorbital 3.33; depth of caudal peduncle 3. Pharyngeal teeth two-rowed, 5, 2, 2, 5; lateral line decurved, rather below median line of side, less curved than ventral outline; body elongate, compressed, moderately deep, deepest in front of ventrals; caudal peduncle compressed, slender; head broad, depressed, flattened above; snout rather acute; mouth terminal, oblique; cleft reaching front of eye; no barbels; eye large, elevated; nostrils close together, posterior, quite large, close to eye.

Dorsal short, high, anterior, inserted nearer tip of snout than base of caudal by a distance equal to two-fifths of head; longest ray 1.33 in head; caudal rather shallowly emarginate; pectorals low, short, 1.66 in head, not reaching ventrals, which are inserted one-third of their length before dorsal, and are short, barely reaching anal; anal short, high, inserted under next to last dorsal ray; scales rather small, cycloid, most distinct on sides.

Color in spirits dusky above; median line of back dark; a dark median line on sides posteriorly, becoming broader and less distinct in pectoral region; under parts and fins pale.

Described from ten specimens, the type two inches in total length taken at Chinnampo, Korea. The type is No. 4561 in the Catalog of the Carnegie Museum.

This species is easily distinguished from *Pseudaspius bergi* by its deeper body, slenderer caudal peduncle, fewer scales, etc.

76. **Culter recurviceps** (Richardson).

Chemulpo (Jouy).

77. **Culter ilishæformis** Steindachner.

Seoul (Steindachner).

Berg, perhaps correctly, identifies this with *Culter erythropterus* Basilewsky, from about Peking.

78. **Ochetobius lucens** Jordan & Starks.

Chemulpo (Jouy).

Fig. 20. *Ochetobius lucens* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVIII, p. 196.)

Family PŒCILIIDÆ.

79. **Oryzias latipes** (Temminck & Schlegel). "Kuaushin" (Korean name "Sogusari").

Fusan (Jouy); Suigen (No. 4210a–o).

Fig. 21. *Oryzias latipes* (Schlegel). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXI, p. 290.)

Family MONOPTERIDÆ.

80. **Monopterus albus** (Zuieuw). (Korean name "Ugo.")

Suigen (No. 4164a).

(*Apterygia saccogularis* and *Apterygia nigromaculata* Basilewsky.)

Family ANGUILLIDÆ.

81. **Anguilla japonica** (Temminck & Schlegel). "Unagi" (Korean name "Penijan").

Fusan, Tsushima (Suigen No. 4123a; "Korea" 4495a–d).

Family LEPTOCEPHALIDÆ.

82. **Leptocephalus anago** (Temminck & Schlegel). "Anago."
Fusan market.

83. **Leptocephalus myriaster** (Brevoort).
Common in the market at Fusan.

Family MURÆNESOCIDÆ.

84. **Murænesox cinereus** (Forskål). "Hamo."
Fusan (No. 4498a–d).

Family OPHICHTHYIDÆ.

85. **Ophisurus macrorhynchus** (Bleeker).
Fusan ("Korea" No. 4536a).
This species may be the same as *Ophisurus serpens* of the Mediterranean.

Family BELONIDÆ.

86. **Tylosurus anastomella** (Cuvier & Valenciennes). "Datsu."
Belone esocina Basilewsky, *Ichthyographia Chinæ Borealis*, p. 260, from Shandun.
Fusan (No. 4484a–b).

Family HEMIRAMPHIDÆ.

87. **Hyporhamphus sajori** (Temminck & Schlegel). "Sayori."
Belone microstoma Basilewsky, *Ichthyographia Chinæ Borealis*, p. 260, Shandun.
Fusan (No. 4549a). Common; Chinnampo (No. 4158a).

Family EXOCŒTIDÆ.

88. **Cypselurus hirundo** (Steindachner). "Tobino."
One specimen, Fusan (No. 4304a).

Family SYNGNATHIDÆ.

89. **Syngnathus schlegeli** Kaup. "Yoji."
Chinnampo (No. 4309a–x); Gensan (Jouy).
The specimens are very slender, the snout 1.75 in head.

90. **Hippocampus chinensis** Basilewsky.

(*Ichthyographia Chinæ Borealis*, p. 249.)

Gulf of Pechili; "often seen dried in the markets of Peking." The description of Basilewsky gives no characters by which the identity of the species can be determined, among the numerous sea-horses found on the coasts of Japan and China.

Family AULORHYNCHIDÆ.

91. **Aulichthys japonicus** Brevoort.

Fusan (Jouy).

Family GASTEROSTEIDÆ.

92. **Pygosteus sinensis** (Guichenot).

Gensan (Jouy).

Family SPHYRÆNIDÆ.

93. **Sphyræna obtusata** (Cuvier & Valenciennes). "Kamasu."

Fusan, common; a fine food-fish ("Korea" 4553a–c).

Family MUGILIDÆ.

94. **Mugil cephalus** Linnæus. "Bora."

Mugil soiuy Basilewsky, *Ichthyographia Chinæ Borealis*, p. 226, pl. IV, fig. 3. ("Korea" 4544a–b, 4501a–c.)

Fusan, abundant. The Japanese species differs little, if at all, from the European *Mugil cephalus*.

95. **Liza hæmatochila** (Temminck & Schlegel). "Menada."

Common in Fusan market. Chinnampo (No. 4128); Chemulpo (Schmidt).

Family BERYCIDÆ.

96. **Beryx decadactylus** Cuvier. "Kimmedai."

Fusan.

Family SCOMBRIDÆ.

97. **Scomber japonicus** Houttuyn. "Saba."

Chinnampo (No. 4380a); Fusan (Korea 4543a–e).

98. **Auxis thazard** Lacépède. "Sodakatsu."

Fusan (No. 4478a). Common in the Tsushima Straits.

99. **Scomberomorus niphonius** (Temminck & Schlegel). "Sawara."

Fusan; a common food-fish.

100. **Scomberomorus sinensis** (Lacépède). "Sawara."

Fusan, common; valued as a food-fish.

101. **Acanthocybium sara** (Lay & Bennett). "Okisawara."

Abundant in the Straits of Tsushima. Specimens five to seven feet long are sent daily to the market at Seoul from Fusan. The large teeth are $\frac{18+18}{20+20}$.

The species of *Acanthocybium*, locally called "Ono," found at Honolulu, presumably the original *Acanthocybium solandri* (type from Tahiti), is a very distinct species, with much smaller teeth, $\frac{50+50}{50+50}$; the snout sharper, and the body slenderer. The huge size of these fishes makes it usually impossible to retain specimens. The existence of the two species in the Pacific renders it highly probable that the Atlantic species *Acanthocybium petus* (Poey) is distinct from both.

Family TRICHIURIDÆ.

102. **Trichiurus japonicus** Temminck & Schlegel. "Tachinono."

Chinnampo (No. 4183a–c), Fusan; Chemulpo ("Korea" 4485a–4494a–c).

One of the most abundant of the food-fishes especially valued by the Koreans. The flesh is pale and watery, without much flavor, but nutritious.

Family CARANGIDÆ.

103. **Trachurus japonicus** (Temminck & Schlegel). "Maazi."

Fusan ("Korea" 4555a–e). Not evidently different from the *Trachurus trachurus* or *semiarmatus* of the north of Europe.

104. **Seriola aureovittata** (Schlegel). "Buri."

Fusan; a common food-fish.

Family STROMATEIDÆ.

105. **Psenopsis anomala** (Temminck & Schlegel).

Fusan market.

Family STROMATEOIDIDÆ.

106. **Stromateoides argenteus** (Euphrasen). (Plate IV.)

"Manakatsuo." A common and valued food-fish (Fusan No. 4117).

This is the original *Stromateus argenteus* of Euphrasen, 1788, the *Stromateus aculeatus* of Cuvier & Valenciennes, differing from the common Chinese species

(*Stromateoides candidus*) (found also rarely in Japan) by its large number of fin-rays.

The Chinese species, abundant in Canton, is *Stromateus argenteus* of Bloch, 1794, which is the same as *Stromateus candidus* and *Stromateus securifer* of Cuvier & Valenciennes, and *Stromateus punctatissimus* of Schlegel. This species, distinguished by the falcate soft dorsal, with dorsal rays 41, and anal rays 39, should apparently stand as *Stromateoides candidus*. *Stromateus nozawæ* Ishikawa from the Bay of Tokyo is like *Stromateoides argenteus*, but differs apparently in the very high dorsal and anal, the lobes when depressed reaching the caudal.

The following is a description of *Stromateoides argenteus* (Euphrasen), taken from a specimen 185 mm. long, collected at Fusan, Korea: D. 46; A. 43; depth 1.45 in length; head 4.25; eye in head 4.5; snout 3.33. Mouth small, inferior, maxillary reaching to below front of pupil; dorsal beginning half-way between mouth and caudal peduncle; nape high; head sloping to the rounded, blunt snout; back sloping both ways from beginning of dorsal, the profile both anteriorly and posteriorly being nearly straight, but the former more abruptly sloping; dorsal high in front, fourth ray one-third longer than head, sloping abruptly to the fourteenth or fifteenth ray, which is less than one-third the length of the longest ray; anal similar, but with the anterior lobe higher (almost twice head), inserted well behind the origin of the dorsal; pectoral one and one-half times the length of the head, rounded; caudal deeply forked; caudal peduncle short, equal to the length of the last anal rays.

Color silvery below the lateral line, which runs high, following the outline of the back; upper parts above lateral line dusky, somewhat metallic; vertical fins margined with black.

We know of no other differences between this species and *Stromateoides candidus*, except that the latter has the dorsal rays 41 and the anal 39. The two are doubtless "geminate" species, *Stromateoides argenteus* being from the north and *Stromateoides candidus* from the south.

107. **Stromateoides echinogaster** (Basilewsky). (Plate V.)

Chinnampo (No. 4572); Port Arthur (Abbott).

This species is distinguished from *Stromateoides argenteus* by the inequality of the lobes of the caudal fin in the adult. In the young the upper lobe is nearly as long as the lower, but with increasing age the lower lobe is one-third to one-half longer than the other. The species is the geminate representative of *Stromateoides cinereus* Bloch, of India, differing chiefly in the increased number of fin-rays, being D. 44 to 46, A. 41 to 43 in *Stromateoides*

echinogaster; and D. 40, A. 38 in *Stromateoides cinereus*. The name *echinogaster* refers to the spinules in the œsophagus, common to all stromateoid fishes.

Description taken from eight specimens, 4.5 to 5.5 inches in total length, collected at Chinnampo, Korea:

D. 46; A. 43; depth 1.4; head 4.5; eye 3.33; snout 4; interorbital 2.4; pectoral 2.6 in body-length; depth of caudal peduncle 2.66 in head; longest dorsal ray 3.5 in body. Body rhombic, very deep and compressed, deepest under origin of dorsal; nape high; profile of head very steep; snout very blunt, rounded, projecting beyond mouth; eye rather large, median, above level of mouth; gill-openings lateral, vertical or slightly inclined forward, 1.4 in head; nostrils large, posterior several times as large as anterior, both remote from eye, close together, near tip of snout; lateral line high, irregular in outline, roughly corresponding to dorsal outline.

First ten dorsal spines modified into anvil-shaped scutes, which are raised above the surface and are sharp at both ends. These are covered with flesh in the adult examples, and are not counted in the number given above for the dorsal and anal rays; first to fourth rays graduated, fourth longest, longer than head; remaining rays growing rapidly shorter to about the fifteenth, which is less than one-third the length of highest, and is about equal to the following ones; anal similar to dorsal, but of fewer rays and scutes; pectoral elongate, slender, reaching half-way to caudal, extending to dorsal notch; caudal deeply notched, the lower lobe usually the longer.

Color in spirits almost black above the lateral line, especially on top of caudal peduncle; below lateral line the sides become gradually lighter to about the median part, below which they are silvery, except in some specimens where the silver color is rubbed off; posterior part of opercle and margins of vertical fins black; pectoral pale or faint dusky. In most specimens the body and head are irregularly speckled with fine black points. A specimen from Port Arthur, noted by Jordan and Starks as *Stromateoides cinereus*, has D. 44; A. 42. One from Swatow has D. 44; A. 41. It is quite possible that the two forms *cinereus* and *echinogaster*, geminate species, the one northern, the other southern, may be found to intergrade.

Family EQUULIDÆ.

108. **Leiognathus argenteus** (Houttuyn). "Gira."

Fusan (*Equula nuchalis* of Schlegel). (No. 4256a.)

Family RACHYCENTRIDÆ.

109. **Rachycentron pondicerrianum** (Cuvier & Valenciennes). "Sugizame."

One large specimen seen in the museum at Fusan. It is not clear that this Asiatic species is distinct from *Rachycentron canadum* of the Atlantic.

Family CHEILODIPTERIDÆ.

110. **Amia lineata** (Schlegel).

Market of Fusan.

111. **Scombrops boöps** (Houttuyn).

Tsushima (Jouy).

Family PRIACANTHIDÆ.

112. **Priacanthus macracanthus** (Cuvier & Valenciennes).

Fusan (*Priacanthus benmebari* of Schlegel) ("Korea" 4511).

Family SERRANIDÆ.

113. **Lateolabrax japonicus** (Cuvier & Valenciennes). "Suzuki."

Fusan, abundant. ("Korea," Nos. 4479a, 4481a, 4552a–b, 4580.)

The dark spots on the sides are more distinct than usual in Japanese specimens. The species described from Pechili and Naukin as *Labrax lyiuy* by Basilewsky, *Ichthyographia Chinæ Borealis*, p. 219, is not identifiable unless it be by the Chinese name. It is a fish of the type of *Lateolabrax*, or *Epinephelus*, "blackish in life, striped and banded with dusky after death. Caudal entire; dorsal notched: it lives in all the rivers." Perhaps it is based on *Siniperca chuatsi*.

114. **Siniperca scherzeri** Steindachner. (Plate VI, fig. 1.)

This species is here described from two specimens respectively 160 and 90 mm. long, taken in the River Kan-ko near Fusan, Korea (No. 4174a). A larger specimen from Heijo has precisely the same color-markings (Suigen No. 4173). Head 2.6; depth 3.6; snout in head 3.5; eye 5.16; interorbital 6; depth caudal peduncle 3.6; maxillary 2.2. Dorsal XII, 13; anal III, 9; pores in lateral line about 100; series of scales along lateral line about 126, between lateral line and dorsal 23 to 25.

Body long, slender, compressed, deepest under fourth dorsal spine; head depressed in front, the upper profile descending abruptly at nape, and thence gradually in a straight line to tip of long, pointed snout. Lower jaw strongly

projecting; outline of back arched, descending abruptly under last three rays of soft dorsal; caudal peduncle deeper than long, tapering very little; ventral outline almost straight from snout to anal.

Spinous dorsal low, gently and evenly rounded from tip to tip; longest spine 3 in head; soft dorsal rounded, slightly higher than spinous dorsal, its base one-half that of the latter; caudal rounded; anal short, rounded, as high as soft dorsal; second spine longer and much stronger than longest dorsal spine; ventrals as long as pectorals, not nearly reaching vent; pectorals narrow. Maxillary reaching posterior margin of eye; preopercle with numerous small spines above, two larger ones at angle, and two on margin below; opercle with two broad, flat spines above; interorbital area slightly concave, smooth; body covered with very small ctenoid scales in uniform series; cheeks, opercles, and temporal region with small embedded scales; remainder of head naked; fins not scaled, except caudal base.

Color in spirits light brown, sides below lateral line with large round or ovate dark spots, separated by narrow, light, undulating streaks, forming rings around the spots. Above the lateral line the spots are smaller and more separated. Indistinct dark blotches are evident on back below middle of spinous dorsal, and below front of soft dorsal, and on caudal peduncle below last dorsal ray. Head above dark, with small, round, black spots; cheeks and opercles and all fins, except pectorals, spotted like upper part of sides; throat and belly white; spinous dorsal margined with black.

This species agrees fairly well with the description of *Siniperca scherzeri* Steindachner from the lower Yangtse River. It differs in the number of finrays (Dorsal XIII, 11 or 12 in *Siniperca scherzeri*), in the sharper and longer snout, and in the sharper coloration. It is probable that Steindachner's figure was taken from an older fish than the one here figured, but of the same species.

115. **Siniperca chuatsi** (Basilewsky).

(*Perca chuatsi* and *Perca chuantsi* Basilewsky, *Ichthyographia Chinæ Borealis*, p. 218? *Labrax lyiuy* Basilewsky, p. 219.)

Keumsan, Southern Korea (Schmidt). Not seen by us.

116. **Coreoperca herzi** (Herzenstein).

(*Coreoperca whiteheadi* Boulenger.)

Pung-tung (Herz) Not seen by us.

117. **Stereolepis ischinagi** (Hilgendorf). "Ishinagi."

A large specimen in the museum at Fusan.

FIG. 22. *Stereolepis ischinagi* (Hilgendorf). (After Jordan & Richardson, Proc. U. S. N. M., Vol. XXXVII, p. 436.)

118. **Epinephelus tsirimenara** (Temminck & Schlegel). "Tsirimenara."
Seen in the Fusan museum.

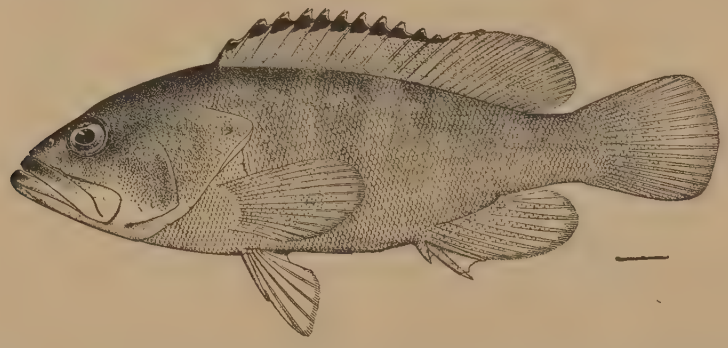


FIG. 23. *Epinephelus tsirimenara* (Temminck & Schlegel). (After Jordan & Richardson, Proc. U. S. N. M., Vol. XXXVII, p. 461.)

119. **Epinephelus septemfasciatus** (Thunberg).
Fusan market.

120. **Epinephelus awoara** (Temminck & Schlegel). "Aoara."
Fusan market.

121. **Epinephelus ionthas** sp. nov. (Plate VI, fig. 2.)
Type No. 4559, 14 inches, Fusan, Korea.
D. XI, 17; A. III, 8; head 2.33; depth 2.87; eye 5.75; maxillary 2.75;

interorbital 6; scales about 15, 95. Dorsal outline more convex than ventral; body deep, greatest depth through axil of pectoral; profile of head arched above, rather high at nape, nearly straight from tip of snout to nape; lower jaw strongly projecting, entering dorsal profile; back high under spinous and most of soft dorsal, descending rather abruptly to deep, short, caudal peduncle, which is two-thirds as long as deep; caudal rounded; both dorsals high, with a shallow notch between; first four dorsal spines graduated, fourth highest, equal to longest soft ray, which is 2.75 in head; origin of dorsal above margin of preopercle; origin of ventrals well behind axil of pectoral; pectoral rounded, broad, reaching tips of ventrals, but not nearly to vent; mouth large, slightly oblique; maxillary reaching well behind eye; teeth on sides of lower jaw in two rows; body and head, except mandibles and maxillaries scaled; scales on anterior part of head, and ventral part of head and body very small; dorsal and anal unscaled.

Color in spirits light; sides thickly covered with round dark spots (orange-red in life), about one-fourth the diameter of eye, separated by narrow light interspaces; spots becoming more or less confluent and indistinct on middle and lower part of sides; head lighter, the spots more scattered; cheeks dark with round light spots; mandibles and maxillaries uniformly light in color; below the sixth and seventh dorsal spines is an indistinct dark blotch, followed under the last four spines by one which is larger and more conspicuous. No spots below soft dorsal; spinous dorsal light with a narrow dark margin; soft dorsal spotted like body; caudal dusky, black-edged; anal with black margin and a black bar one-third from base; ventrals tipped with black; pectorals pale.

Described from the type, which is fourteen inches in total length, and was taken at Fusan, Korea. It is No. 4559 in the Catalog of the Carnegie Museum. Numerous other specimens were seen in the market.

The species is allied to *Epinephelus akaara*, but is distinguished by the color and the deeper body.

Family HÆMULIDÆ.

122. **Pomadasis hasta** (Bloch).

Fusan (Jouy).

123. **Hapalogenys nigripinnis** (Temminck & Schlegel).

Fusan ("Korea" 4502a).

124. **Hapalogenys mucronatus** (Eydoux & Souleyet).

Chinnampo (No. 4113a), Fusan. ("Korea" 4507a–b, 4522a–e.) Called

"Banzaidai," apparently a vernacular name. It was transferred by Schlegel to *Banjos banjos*, to which it may possibly properly belong.

125. **Plectorhynchus cinctus** (Temminck & Schlegel).
Fusan ("Korea" 4537a–b).

Family SPARIDÆ.

126. **Pagrosomus major** Temminck & Schlegel. "Madai," "Tai," "Akadai."
Pagrus arthurius Jordan and Starks.
Port Arthur (Abbott); Fusan, Chemulpo ("Korea" 4540a–i).

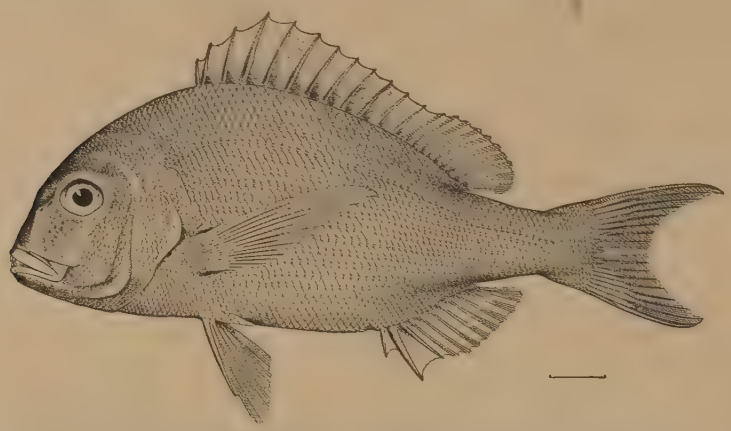


Fig. 24. *Pagrosomus major* Temminck & Schlegel. (After Jordan & Starks, Proc. U. S. N. M., Vol. XXXI, p. 518.)

Abundant; one of the most important Japanese food-fishes; equally abundant in Korea. The specimen from Port Arthur, named *Pagrus arthurius*, is an ordinary "red tai," with the third dorsal spine injured.

127. **Evynnis cardinalis** (Lacépède). "Kodai."
Fusan (Jouy).

128. **Taius tumifrons** (Temminck & Schlegel).
Abundant in Tsushima Straits, in deep water.

129. **Sparus macrocephalus** (Basilewsky). "Kurodai."
(*Chrysophrys swinhonis* Günther.)
Fusan, common ("Korea" 4496a). This species has watery flesh, very much inferior to that of the red tai, or "akadai" (*Pagrosomus major*). It is evident that this is the species poorly figured and poorly described by Basi-

lewsky as *Pagrus macrocephalus*. This name must replace that of *Sparus swinhonis*, adopted from Günther, by Jordan and Thompson. In the numbering

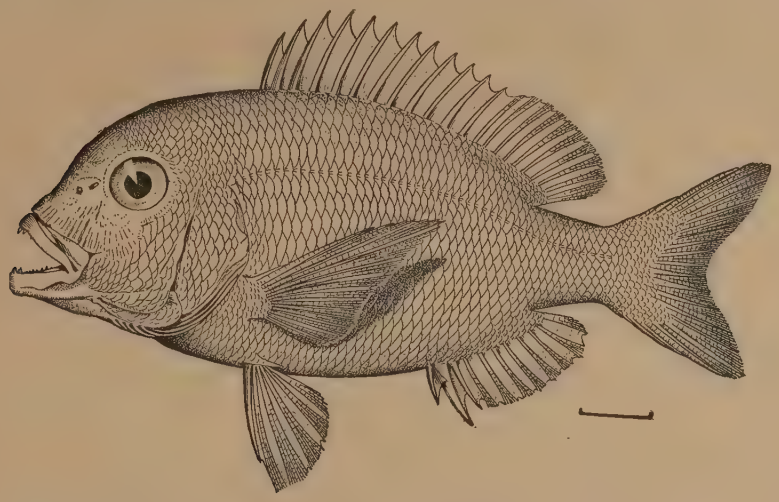


FIG. 25. *Taius tumifrons* (Temminck & Schlegel). (After Jordan & Thompson, Proc. U. S. N. M., Vol. XLI, p. 572.)

of his plates, Basilewsky has transposed this species and his *Sciæna tenlo* (= *Sciæna albiflora*).

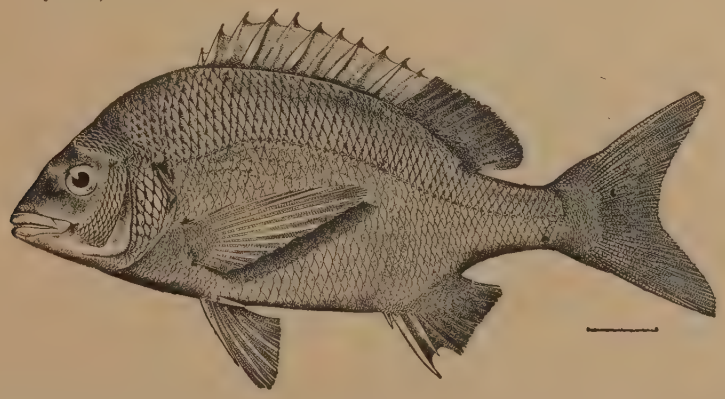


FIG. 26. *Sparus macrocephalus* (Basilewsky). (After Jordan & Thompson, Proc. U. S. N. M., Vol. XLI, p. 587.)

Family SCIÆNIDÆ.

130. **Sciæna japonica** (Temminck & Schlegel). (Plate VII, fig. 1.) "Nibe."
? *Sciæna miiuy* Basilewsky, *Ichthyographia Chinæ Borealis*, p. 22, Pechili.
Chinnampo (No. 4356a and 4368a), Fusan ("Korea" 4493a–d, 4581); a

common food-fish, but not highly valued, being reputed to be rather coarse. It reaches a length of about four feet.

The species has not been recorded since the time of Temminck and Schlegel, who knew it only from a drawing by Bürger, a drawing perfectly recognizable. The existence of the species has been questioned by Steindachner, and by Jordan and Thompson.

The following are the field notes of Dr. Jordan (Seoul Market). Dark dusty gray in life. Dorsal and caudal black; a faint, dark, axillary blotch. Preopercle with long, slender, flexible points. Body slender; caudal rhombic; scales loose. Outer teeth in both jaws equally enlarged; head pointed; jaws subequal; maxillary 2.66 in head. Pectoral long, 2 in head; anal spines very small. Gill-rakers 10 + 12, including rudiments; all of them short and thick; dorsal scaleless. Dorsal X, I, 29; anal II, 7; scales 75. All the dorsal spines low, the third highest.

131. **Sciæna albiflora** (Richardson). "Akaguchi," "Kuchi."

Sciæna tenlo Basilewsky, *Ichthyographia Chinæ Borealis*, p. 220. Gulf of Pechili.

Port Arthur (Abbott); Fusan, Chinnampo (No. 4357a, 4372a) ("Korea" 4519a).

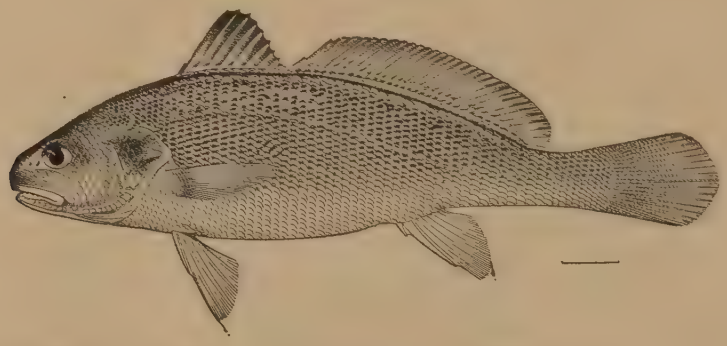


Fig. 27. *Sciæna albiflora* (Richardson). (After Jordan and Thompson, Proc. U. S. N. M., Vol. XXXIX, p. 250.)

Next to the red tai (*Pagrosomus major*) this is the commonest fish at Fusan, being salted in great numbers. In life it is lustrous brassy, or coppery in color, hence called "akaguchi" or red croaker. It is fairly well figured and very poorly described by Basilewsky as *Sciæna tenlo*.

The slight differences separating the Japanese species *Sciæna mitsukurii* from this species seem to hold in our specimens.

132. **Sciæna schlegeli** Bleeker. "Kuchi."

Chinnampo (No. 4259a), Fusan market.

This may be the *Sciæna chanchua* or yellow fish ("piscis flavus pictus") of Basilewsky, *Ichthyographia Chinæ Borealis*, p. 221. The description is however very inadequate, and might refer to *Sciæna manchurica*.

133. **Sciæna iharæ** sp. nov. (Plate VII, fig. 2.) "Guchi."

Type No. 4371, 300 mm. Fusan, Korea.

Head 3; depth 3.25; eye 6 in head; 1.66 in snout; interorbital 3.5 in head; maxillary 2.33. Dorsal X, 29; anal II, 7; scales 8, 50, 12 or 13 (above ventrals); gill-rakers 7 + 9, comparatively short and stout; longest one .4 diameter of eye.

Body compressed, its width 2 in depth, elongate, deepest through base of pectorals; lower outline only slightly curved; head rather long; snout not abruptly blunted, its outline continuing to the even curve of profile of head above; lower jaw included; maxillary reaching posterior fourth of eye; teeth in two rows, the outer conical, sharp, and slender, the inner minute; angular bone of lower jaw notched posteriorly and projecting mesially, on this projection a slender, deciduous spine, which is hinged below and depressible into a groove at base; preopercle unarmed, its margin finely notched; opercle with two, flat, flexible points. Scales large, ctenoid, firm, covering body and head, except lips; no scales on vertical fins, but soft dorsal and anal sheathed with a row at base.

Pectorals long, narrow, pointed, 1.4 in head; ventrals inserted below axil of pectoral, reaching about two-thirds distance to vent; spinous dorsal rather short and high, its base 1.8 in soft dorsal; fourth spine 2.75 in head; soft dorsal uniform, about .8 height of first dorsal; caudal rounded; anal short, rounded, higher than spinous dorsal.

Color silvery below, brownish above; dorsal edged with dusky; a conspicuous black blotch on opercle; centers of scales dark, forming indistinct longitudinal bands, irregularly broken above and below.

Described from the type 300 mm. long, collected by Dr. Jordan at Fusan, Korea (No. 4371a). It is named for Mr. B. Ihara, the Commissioner of Fisheries in Chosen.

This species resembles *Sciæna schlegeli* (Bleeker), but has firmer flesh, with non-deciduous scales, has a longer, less blunt snout, a much smaller eye, (6 in head instead of 4), and has 29 instead of 25 to 27 rays in the soft dorsal. Basilewsky's *Sciæna arcuata*, *Ichthyographia Chinæ Borealis*, p. 221, salted for the market of Peking and sent up from southern China, is some species of this type. It cannot be *Sciæna iharæ*, as it is said to have 11 or 12 dorsal spines.

In the paper on the Sciænidæ of Japan, by Jordan and Thompson, the name *Sciæna argentata* is accepted from Houttuyn for the species called *Sciæna bleekeri* by Steindachner. On fuller comparison we are obliged to reject Houttuyn's trivial description as inadequate and unidentifiable. The Japanese species from Tokyo, in question, however, cannot be *Sciæna bleekeri*, which is an Indian species. It must apparently receive the substitute name, suggested by Dr. Döderlein, of *Sciæna yeddoënsis*.

134. **Sciæna manchurica** Jordan & Thompson.
Port Arthur (Abbott).

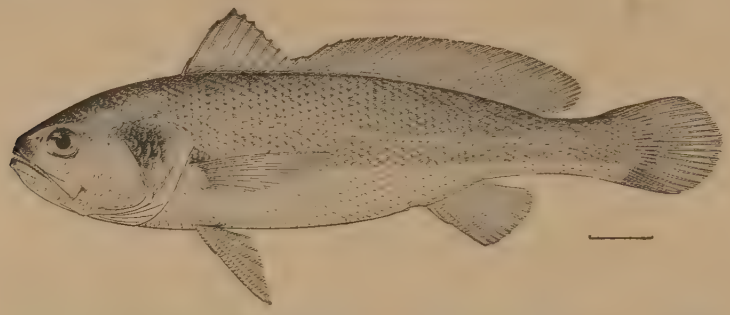


Fig. 28. *Sciæna manchurica* Jordan & Thompson. (Proc. U. S. N. M., Vol. XXXIX, p. 256.)

135. **Laramichthys rathbunæ** Jordan & Starks.
Chinnampo (No. 4141a); Fusan (Jouy).

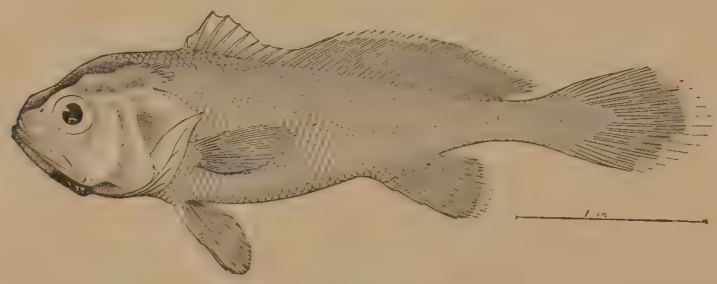


Fig. 29. *Laramichthys rathbunæ* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVIII, p. 204.)

This specimen from Chinnampo, in much better condition than the original type, agrees with it in all essential respects.

136. **Collichthys lucidus** (Richardson).
(? *Sciæna meygun* Basilewsky, *Ichthyographia Chinæ Borealis*, p. 222; Southern Sea of China.)

Sciæna meygun Basilewsky, said to be brought to Peking, salted, from the sea to the south, is certainly a species of *Collichthys*, but no specific characters are given. The dorsal rays in *C. lucidus* are 33.

Korea (Bernadou).

137. **Collichthys fragilis** Jordan & Seale.

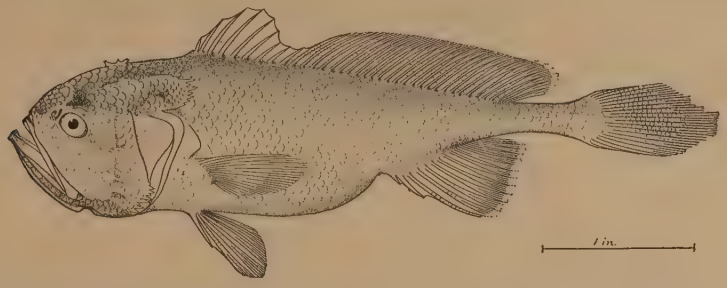


Fig. 30. *Collichthys fragilis* Jordan & Seale. (Proc. U. S. N. M., Vol. XXIX, p. 523.)

Port Arthur (Abbott); Fusan market. Locally very abundant. Dorsal rays 27.

138. **Collichthys niveatus** Jordan & Starks.

Chinnampo (No. 4577); Port Arthur (Abbott). Dorsal rays 24.

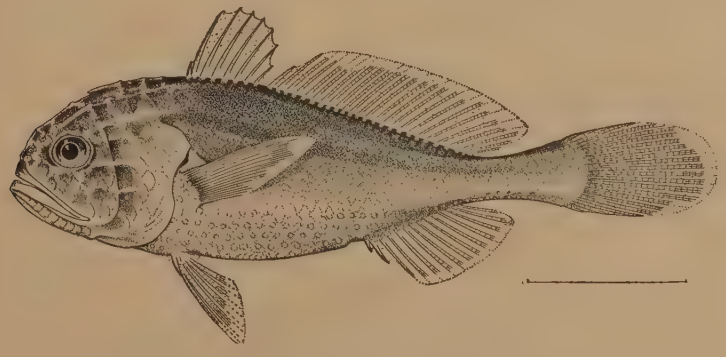


Fig. 31. *Collichthys niveatus* Jordan & Starks. (Proc. U. S. N. M., Vol. XXXI, p. 519.)

Family MULLIDÆ.

139. **Upeneoides bensasi** (Temminck & Schlegel).

"Himeji." Jinsen (No. 4320a–b).

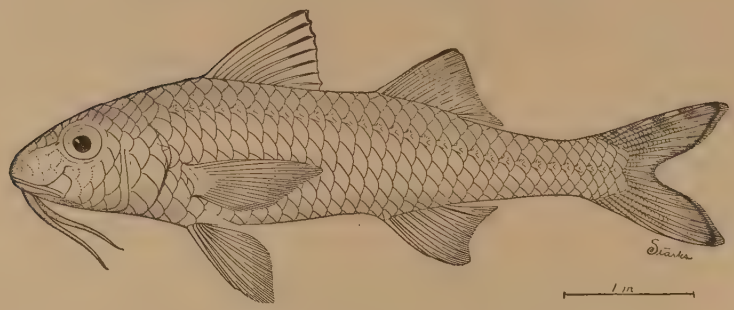


FIG. 32. *Upeneoides bensasi* (Temminck & Schlegel). (After Snyder, Proc. U. S. N. M., Vol. XXXII, p. 98.)

Family POLYNEMIDÆ.

140. **Polydactylus agonasi** Jordan & McGregor.

Seen in Fusan museum.

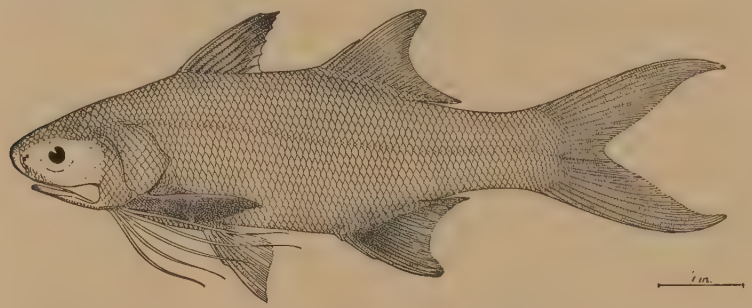


FIG. 33. *Polydactylus agonasi* Jordan & McGregor. (Proc. U. S. N. M., Vol. XXX, p. 815.)

141. **Polydactylus prionostomus** (Basilewsky).

Osteoglossum prionostoma Basilewsky, *Ichthyographia Chinæ Borealis*, p. 211; Gulf of Pechili.

This species is not known to us. It is evidently a species of *Polydactylus*, but it is described as having six free pectoral filaments ("pectoralium priores radii sex longi"). The only species of *Polydactylus* yet known from these waters is *Polydactylus agonasi* with five free filaments. The fins in *Polydactylus prionostomus* are said to be pale. In the Chinese species with six filaments, *P. xanthonemus* and *P. sectarius*, the pectorals are black.

Family OPLEGNATHIDÆ.

142. **Oplegnathus fasciatus** (Temminck & Schlegel).

Fusan ("Korea" 4504a).

Family CIRRHITIDÆ.

143. **Goniistius zonatus** (Cuvier & Valenciennes).
Fusan ("Korea" 4483a).

FIG. 34. *Goniistius zonatus* (Cuv. & Val.). (After Jordan & Herre, Proc. U. S. N. M., Vol. XXXIII, p. 164.)

Family SILLAGINIDÆ.

144. **Sillago sihama** Forskal. "Kisu."
Chinnampo, Fusan (No. 4163a, 4321a); common.

Specimens of this species show great variation in the depth of the body, attenuation of the head and snout, and height of the spinous dorsal. All seem to belong to one species, however, and to be identical with others from Japan, Swatow, Hong Kong, Formosa, and the Philippines.

Family PTEROPSARIDÆ.

145. **Neopercis sexfasciata** (Temminck & Schlegel). "Toragisu."
Fusan ("Korea" 4525a–b).

146. **Neopercis snyderi** Jordan & Starks.
Korea (Jouy).

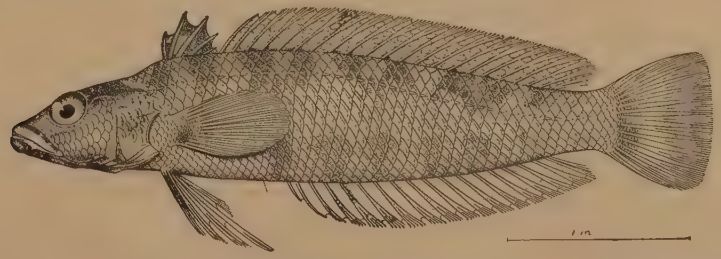


FIG. 35. *Neopercis snyderi* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVIII, p. 211.)

Family URANOSCOPIDÆ.

147. **Uranoscopus japonicus** Houttuyn.
Fusan ("Korea" 4551a–b).

Family ANABANTIDÆ.

148. **Polyacanthus opercularis** (Linnæus). (Korean name "Pottrupungo.")
Suigen (No. 4122a–i); Fusan (Jouy).

149. **Macropodus viridi-auratus** Lacépède.
Seoul (Steindachner).

Family OPHICEPHALIDÆ.

150. **Ophicephalus argus** Cantor. "Eso."

(No. 4523a.) Very abundant in the Han River at Seoul, and daily brought alive into the markets. The species was described by Cantor from Chusan Island off Shanghai. *Ophicephalus pekinensis* Basilewsky is apparently the same.

Family EMBIOTOCIDÆ.

151. **Ditrema temmincki** Bleeker.
Fusan, common.

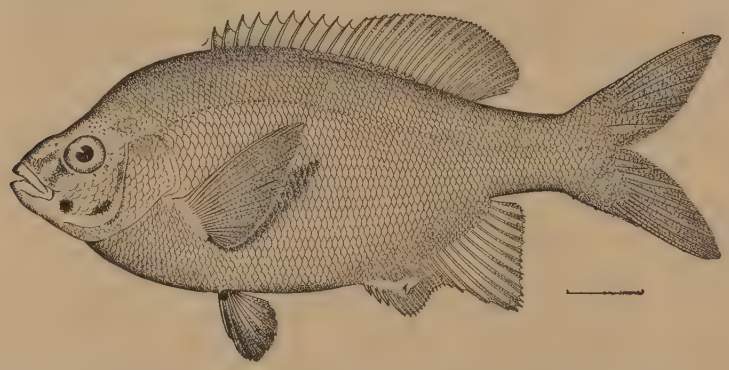


Fig. 36. *Ditrema temmincki* Bleeker. (After Jordan & Sindo, Proc. U. S. N. M., Vol. XXIV, p. 358.)

152. **Neoditrema ransonneti** (Steindachner).
Tsushima (Jouy).

153. **Chromis notatus** Temminck & Schlegel.
Tsushima (Jouy).

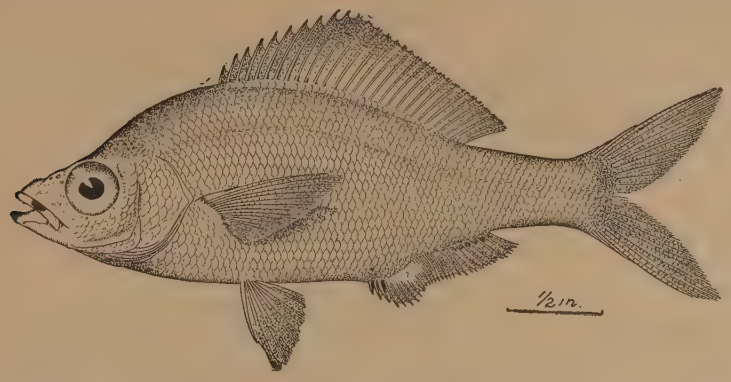


FIG. 37. *Neoditrema ransonneti* (Steindachner). (After Jordan & Sindo, Proc. U. S. N. M., Vol. XXIV, p. 356.)

Family LABRIDÆ.

154. **Semicossyphus reticulatus** Cuvier & Valenciennes.
Fusan, specimens large and small (No. 5413a–b).

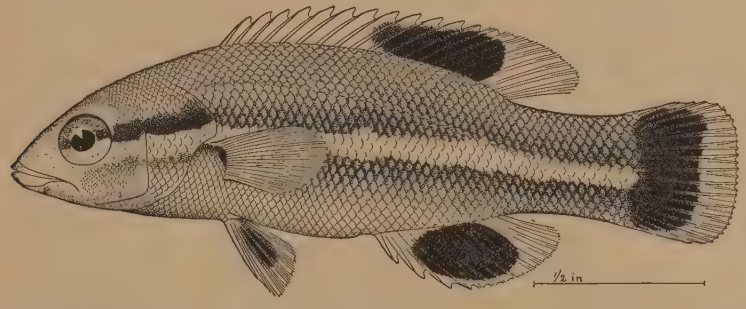


FIG. 38. *Semicossyphus reticulatus* Cuv. & Val. (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIV, p. 622.)

155. **Pseudolabrus japonicus** (Houttuyn).
Fusan, common; Tsushima (Jouy) ("Korea" 5447a).

156. **Halichœres bleekeri** Steindachner & Döderlein. "Aobera."
Fusan (No. 4312).

157. **Halichœres pœcilopterus** (Temminck & Schlegel). "Akabera."
Three males and one female; the former corresponding to the "*pyrrhogrammus*" of Temminck and Schlegel. Such large sexual difference as occurs in this species is rare among the *Labridæ*.
Fusan (No. 4542a).

Family ZEIDÆ.

158. **Zeus japonica** Temminck & Schlegel. "Matodai."
Fusan, Straits of Tsushima ("Korea" 4482a).

Family TEUTHIDÆ.

159. **Teuthis fuscescens** (Houttuyn). "Aigo."
Fusan (No. 4204a–j).

Under the present rules of the International Congress of Zoologists, *Teuthis* Linnæus should apparently replace *Siganus* Forskål. The genus *Teuthis* of Linnæus included a species of *Hepatus* (*hepatus* Linnæus) (*Acanthurus* Forskål) and one *Siganus* (*javus*). It was first restricted to *Teuthis javus* Linnæus and its allies by Cuvier in 1817, an arrangement followed by Cuvier and Valenciennes, Cantor, and Günther. This adjustment must apparently stand, although the original *Teuthis* of Linnæus (1866) has the same content as the earlier *Hepatus* of Gronow (1765).

Family MONACANTHIDÆ.

160. **Stephanolepis japonicus** (Tylesius).
Fusan (Jouy).

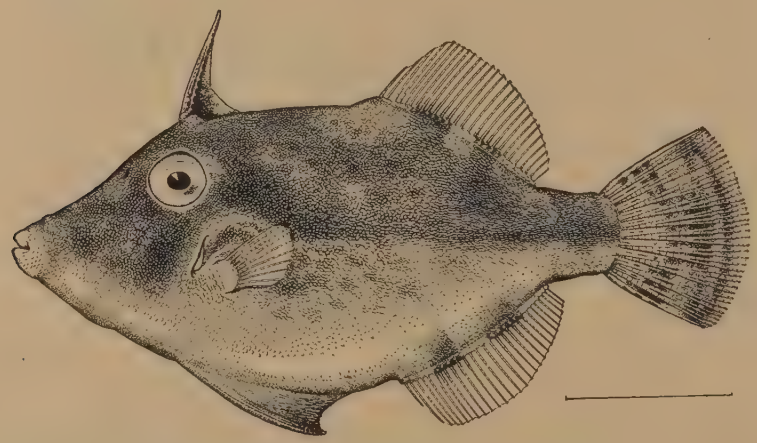


Fig. 39. *Stephanolepis japonicus* (Tylesius). (After Jordan & Fowler, Proc. U. S. N. M., Vol. XXV, p. 266.)

161. **Stephanolepis cirrhifer** (Temminck & Schlegel). "Kawahagi."
Fusan, common (No. 4508a–b).

162. **Pseudomonacanthus unicornu** (Basilewsky). "Unadzura-hayi," "Mahagi."
Balistes unicornu Basilewsky, *Ichthyographia Chinæ Borealis*, 1855, p. 263; Shan Dun province.
Monacanthus modestus Günther, *Annals & Magazine Nat. Hist.*, 1877, p. 446.

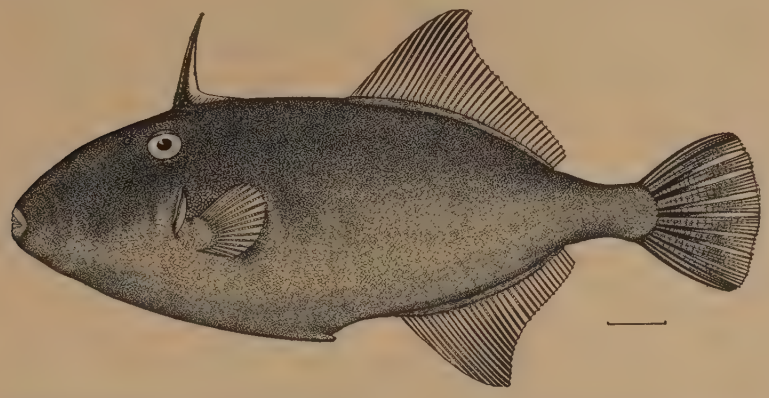


Fig. 40. *Pseudomonacanthus unicornu* (Basilewsky). (After Jordan & Fowler, Proc. U. S. N. M., Vol. XXV, p. 269.)

Fusan; a common market-fish ("Korea" 4486a–c).

There seems no doubt that Basilewsky's description belongs to this particular species, although it contains very little which is not of general application to these fishes. This species is common in the waters of western Korea, and in its measurements it agrees with *B. unicornu*.

163. **Alutera monoceros** (Osbeck).
Fusan ("Korea" 4469a).

Family TETRAODONTIDÆ.

164. **Spheroides rubripes** (Temminck & Schlegel). "Torafugu."
Chinnampo (No. 4374a), Fusan, common ("Korea" 4535a–c).
A large specimen has the prickles on back and belly obsolete.

165. **Spheroides xanthopterus** Temminck & Schlegel.
Chinnampo (No. 4377a); back unspotted.

166. **Spheroides pardalis** (Temminck & Schlegel). "Fugu."
Heijo, Fusan, Chinnampo (No. 4370a); abundant. (Suigen, No. 4576a–b "Korea" 4512a–f.)

167. **Spheroides borealis** Jordan & Snyder.
Chinnampo (No. 4261a).

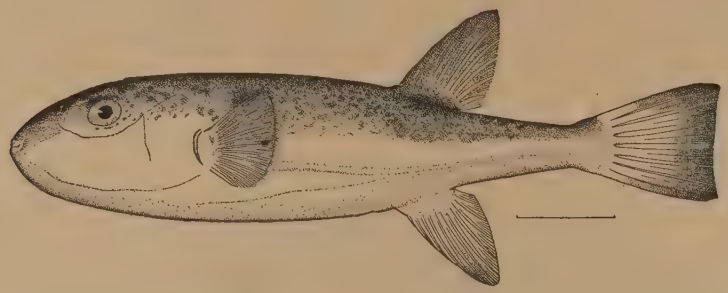


Fig. 41. *Spheroides borealis* Jordan & Snyder. (Proc. U. S. N. M., Vol. XXIV, p. 245.)

168. **Spheroides vermicularis** (Temminck & Schlegel).
Chinnampo (No. 4111a).

169. **Spheroides basilewskianus** (Basilewsky). (Plate VIII, fig. 1.)
Tetraodon basilewskianus Basilewsky, *Ichthyographia Chinæ Borealis*, p. 262; Sea off Peking.
Chinnampo (No. 4573).

A large specimen agrees with the scanty account of *Tetraodon basilewskianus* and differs from the closely related Japanese species *Spheroides alboplumbeus* in the total absence of white spots. It may be provisionally accepted as a valid species.

The following description is from two examples 10 inches long, taken at Chinnampo, Korea:

D. 13; A. 13; head 3; depth 3; eye 8; snout 2.4; interorbital 2; least depth of caudal peduncle 3.2 in head; width of body 3.33 in length. Back and belly with small, stout prickles; caudal truncate; no lateral body fold; body rather stout, elongate, greatest depth through gill-opening; ventral outline very convex, dorsal less so; head broad; snout blunt; interorbital area slightly convex, broad; caudal peduncle depressed, tapering, semi-conical; nostrils papilliform, elevated, as near tip of snout as eye; eye small, elevated, entirely above level of pectoral base; gill-openings vertical, equal to pectoral base, inner flap evident; mouth terminal, broad, teeth large, cutting edges concave; anterior portion of teeth slightly produced, bluntly pointed.

Dorsal high, fifth ray longest, 1.5 in head; posterior rays gradually shortened to near last, then abruptly shortened; distance from insertion of dorsal to tip of snout two and one-half times that from base of caudal, the latter equal-

ling distance from posterior edge of mouth to gill-opening; anal opposite and similar to dorsal; pectoral broad, short, almost truncate; upper rays slightly longer, equal to snout in length.

Color in spirits uniform dusky ashen above upper level of gill-opening, darker on back; an ocellated spot considerably larger than eye near tip of pectoral; area at base of dorsal dark, but without distinct spot; under parts white. Dorsal, anal, and caudal tipped with blackish; pectorals dusky brown; sides and back without any indication of stripes or spots, except the pectoral spots.

This species resembles *Spheroides alboplumbeus* of Japan and Southern China, but differs in size of eye, interorbital width, etc., and also in color, *S. alboplumbeus* being covered above with conspicuous white spots.

Family TRICHODONTIDÆ.

170. **Arctoscopus japonicus** Steindachner.

Chinnampo (No. 4109a–c). Several fine specimens were obtained agreeing perfectly with Steindachner's original description and figure.

The figure published by Jordan and Evermann (Fishes of North and Middle America) from deep water off Iturup Island represents a deeper fish, perhaps specifically distinct.

Family HEXAGRAMMIDÆ.

171. **Pleurogrammus azonus** sp. nov. (Plate VIII, fig. 2.)

Type No. 4558, 14 inches, Chinnampo.

D. XXI, 29; A. 27; scales 20, 180; pores 163; depth 4.5; head 3.6; eye 5.66; maxillary 2.87; snout 3; interorbital 3.33; depth of caudal peduncle 5 in head; body long, rather slender, greatest depth through base of ventrals; dorsal and ventral outlines similar; head rather stout; nape not high; dorsal profile evenly curved; snout blunt; lower jaw included; maxillary reaching to below anterior margin of eye; interorbital area convex; eye moderate, high, but not entering dorsal profile. Dorsal inserted above posterior margin of preopercle, continuous and almost uniform in height throughout; sixth spine 2.6 in head; anal similar to soft dorsal; pectorals large, rounded; fifth to eighth rays longest; ventrals inserted below sixth dorsal spine, reaching not quite to tips of pectorals, slightly over half the distance to anal; caudal large, emarginate, its basal portion trenchant above and below; caudal peduncle stout, almost as broad as deep; gill-rakers 5 + 14, wide apart; mouth rather large, oblique; no teeth on vomer

or palatines; teeth in jaws in bands, outer row enlarged, canine-like, inner rows becoming obsolete on sides; gill-membranes united, free from the isthmus, the opening extending forward slightly below; body, cheeks and upper parts of head with small ctenoid scales, not extending on vertical fins.

First lateral line separated from dorsal by four rows of scales (five anteriorly), each approaching its fellow in front of dorsal and behind dorsal, but in neither case uniting with it. The origin is on top of the head slightly behind eye, the apex is on base of caudal peduncle. Second lateral line runs parallel to first for length of dorsal, then descends abruptly to middle of caudal peduncle and thence in a straight line to base of caudal. Third lateral line extends from a point on a level with the sixteenth pectoral ray and above the middle of the ventrals, to above the last anal ray. Fourth lateral line runs from isthmus along edge of ventrals, to above first anal ray. Fifth extends along base of anal, uniting with its fellow between tips of inner ventral rays, running thence to isthmus. In addition to these there is a short line lying just above the fourth and reaching from above middle of ventrals to opposite vent. On one side of our specimen this unites for a short distance with the fourth, on the other it is free. The first and second lines are separated by fifteen scales anteriorly; the third and fifth by ten scales opposite insertion of anal.

Fig. 42. *Hexagrammus aburaco* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVI, p. 1008.)

Color dusky above, lighter below; fins all dusky; dorsal with black cloudings; caudal lobes black-tipped; no trace of the black cross-bands characteristic of *P. monopterygius*.

Described from the type which is fourteen inches in total length, taken at Chinnampo, Korea. It is No. 4558 in the Catalog of the Carnegie Museum.

This species differs from *Pleurogrammus monopterygius* in the slenderer body,

larger number of fin-rays, larger scales, the different lateral lines, and the absence of dark cross-bars on the body.

172. **Agrammus agrammus** (Temminck & Schlegel).
Fusan (No. 4487a).

173. **Hexagrammus otakii** Jordan & Snyder. "Aburame."
Chinnampo (No. 4365a), and Fusan, common ("Korea" 4489a).

174. **Hexagrammus aburaco** Jordan & Starks. "Ainame."
Fusan (No. 4500a). One specimen of this rare form. It may possibly be a variant of *Hexagrammos otakii*, rather than a distinct species.

Family SCORPÆNIDÆ.

175. **Sebastodes schlegeli** Hilgendorf.
Chinnampo (No. 4162a; No. 4381a), Fusan; Gensan (Schmidt); Tsushima (Jouy) ("Korea" 4531a).

This species is everywhere common in Northern Japan and Korea. The early name, *Sparus fuscescens* of Houttuyn, adopted by Jordan and Starks, is, as we believe, not identifiable. We therefore take a later name, *schlegeli*, apparently not open to doubt.

FIG. 43. *Sebastodes güntheri* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVII, p. 102.)

176. **Sebastodes güntheri** Jordan & Starks.
Chinnampo (No. 4106a).

177. **Sebastodes ijimæ** sp. nov. (Plate IX, fig. 1.)
Type No. 4172, 160 mm. long. Fusan.

Head 2.5; depth 2.73; eye 4 in head; interorbital .5; snout 4.25; maxillary 2; width of maxillary in eye 1.4; depth of caudal peduncle in head 3.16. D. XIII, 13; A. III, 5; pores in lateral line 33; series of scales along lateral line about 62. Body rather short, high, and compressed; greatest depth through base of pectoral; back sloping gently behind and rather abruptly in front of this; profile almost straight from nape to snout; head nearly as deep as long; maxillary reaching well behind eye, posteriorly quite broad; suborbital narrow, less than half as broad as maxillary, bearing two blunt processes anteriorly; preopercle with five short processes, the lowest small; upper angle of opercle with two sharp processes; lower margin with two smaller ones opposite middle of preopercular spine; humeral spine present, short, flat, sharp; occiput and interorbital scaly, almost flat, the armature moderate; preorbital and postorbital spines form a continuous ridge above eye; parietal and tympanic spines small, not elevated; nasal spines prominent.

Spinous dorsal moderately high, rounded; fourth and fifth spines longest, 1.8 in head; notch between dorsals obtuse, the membrane of first dorsal confluent with that of second for one-third its height; soft dorsal truncate, as high as third spine of first dorsal; last three rays only are graduated; caudal bluntly rounded; anal short, high, truncate, its rays as long as fourth dorsal spine; second spine equal to third in length, and much stouter; ventrals inserted behind pectoral base, tips almost reaching anal; pectoral broad, rounded, its lower rays thickened.

Body and head, except snout, preorbital and jaws, covered with strongly ctenoid scales, those of occiput, interorbital and temporal regions abruptly smaller; soft fins scaled at base with minute, numerous scales; peritoneum white; gill-rakers 7 + 18, rather slender, compressed, longest about .4 diameter of eye.

Color dusky, lighter below; fins all dark, tipped with black, except the lower half of pectoral which has a broad, white margin; snout and top of head almost black.

Described from the type, 160 mm. long, taken at Fusan, Korea, by Dr. Jordan (No. 4172a).

This species is near *Sebastodes schlegeli* (Hilgendorf) (Plate X, fig. 1), but is readily distinguished from this by the small number of pores (33 instead of 46) in the lateral line, and by other less conspicuous characters. It is named for Professor Isao Ijima, of the Imperial University of Tokyo, to whom we are indebted for many favors.

178. **Sebastodes inermis** (Cuvier & Valenciennes). "Mebaru."
Fusan (No. 4530a–d).

179. **Sebastodes taczanowskii** Steindachner.
Gensan (Schmidt).

180. **Sebastodes trivitattus** Hilgendorf.
Chinnampo (No. 4363a), Chemulpo.

FIG. 44. *Sebastodes trivittatus* Hilgendorf. (After Jordan & Starks, Proc. U. S. N. M., Vol. XXVII, p. 115.)

181. **Sebastichthys elegans** (Steindachner & Döderlein).
Fusan (No. 4546a), common: common also across the channel at Shimonoseki.

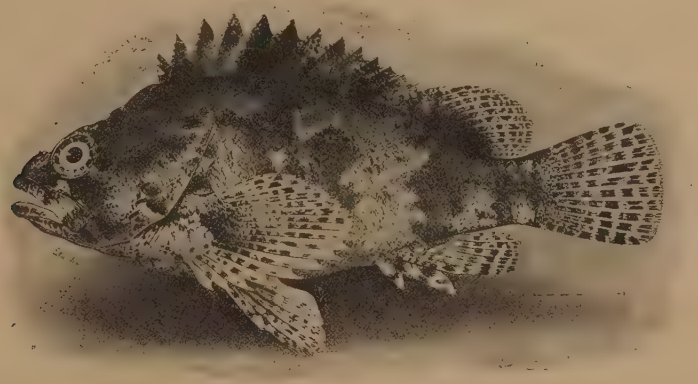


FIG. 45. *Sebastichthys elegans* (Steindachner). (After Jordan & Starks, Proc. U. S. N. M., Vol. XXVII, p. 119.)

182. **Sebastichthys vulpes** (Steindachner & Döderlein).
Fusan (No. 4538a).

183. **Sebastichthys mitsukurii** (Cramer).
Fusan (No. 4499a).

184. **Sebastichthys pachycephalus** (Temminck & Schlegel).
Fusan (No. 4516a).

185. **Sebastiscus marmoratus** (Cuvier & Valenciennes).
Fusan, common (No. 4554a–c); Tsushima (Jouy).

186. **Inimicus japonicus** (Cuvier & Valenciennes). "Kasago."
Fusan, common (No. 4509a–c).

187. **Paracentropogon rubripinnis** (Temminck & Schlegel).
Fusan (Jouy).

Family COTTIDÆ.

188. **Cottus pœcilopus** Heckel.
Pung-tung (Herz).

189. **Trachydermus fasciatus** Heckel.
Trachydermus ansatus (Richardson).
Chemulpo (Jouy).

Fig. 46. *Trachydermus fasciatus* Heckel. (After Jordan & Starks, Proc. U. S. N. M., Vol. XXVII, p. 263.)

We think that the name *fasciatus* should be adopted for this species, as it is quite unlikely that Heckel's type really came from the Philippines. It lives in torrential waters in Korea and Southern Japan, and is recorded from China.

190. **Gymnocanthus intermedius** (Temminck & Schlegel).
Fusan. One specimen.

This specimen deviates from the usual form of this species. The eye is 4.5 instead of 3.5 in head; the armature of the preopercle is poorly developed, the antler-like process having only two horns and not reaching the edge of the preopercle.

191. **Furcina ishikawæ** Jordan & Starks.
Fusan (Jouy).

FIG. 47. *Furcina ishikawæ* Jordan & Starks. (Proc. U. S. N. M., Vol. XXVII, p. 304.)

192. **Bero elegans** (Steindachner).
Chemulpo.

FIG. 48. *Bero elegans* (Steindachner). (After Jordan & Starks, Proc. U. S. N. M., Vol. XXVII, p. 318.)

193. **Pseudoblennius percoides** (Richardson).
Fusan (No. 4550a–b); Tsushima (Jouy).

194. **Pseudoblennius marmoratus** Steindachner.
Tsushima (Jouy).

195. **Hemitripterus villosus** (Pallas).
Chinnampo (No. 4375a); two fine large specimens.

Family AGONIDÆ.

196. **Tilesina gibbosa** Schmidt.
Broughton Bay, Korea (Schmidt).

197. **Podothecus gilberti** Collett.
Cape Pestschnizoff, Korea (Schmidt).

198. **Podothecus thompsoni** Jordan & Gilbert.
Cape Pestschnizoff, Korea.

199. **Anoplagonus inermis** (Günther).
Cape Pestschnizoff.

Family PLATYCEPHALIDÆ.

200. **Platycephalus indicus** (Gmelin). "Kochi."
Chinnampo (No. 4382a), Fusan, common ("Korea" 4545a).

201. **Thysanophrys crocodilus** (Tilesius).
Fusan (No. 4521a).

Fig. 49. *Thysanophrys crocodilus* (Tilesius). (After Jordan & Richardson, Proc. U. S. N. M., Vol. XXXIII, p. 639.)

Family BEMBRIDÆ.

202. **Parabembras curtus** (Temminck & Schlegel).
Fusan (No. 4548a).

Family CYCLOGASTERIDÆ.

203. **Cyclogaster tanakæ** Gilbert & Burke.
Fusan.

Family TRIGLIDÆ.

204. **Cheilidonichthys kumu** (Lesson & Garnot). "Hobo."
Fusan, common (No. 4532a).

205. **Lepidotrigla guntheri** Hilgendorf.
Fusan (Jouy).

206. **Lepidotrigla microptera** (Günther).
Port Arthur (Abbott).

The Japanese form (*Lepidotrigla strauchii* Steindachner) is apparently different from this Chinese species.

Family GOBIIDÆ.

207. **Periophthalmus cantonensis** (Osbeck).
Fusan, on the mud flats (No. 4245a).

208. **Apocryptes chinensis** Osbeck.
Korea (Jouy).

This genus, usually called *Boleophthalmus*, is based on the original type of the genus *Apocryptes* of Osbeck. The name was diverted to a genus of another group by Cuvier.

209. **Odontobutis obscurus** (Temminck & Schlegel). (Korean name "Kuguri.")
Suigen.

210. **Ctenogobius bernadoui** (Jordan & Starks).
Korea (Jouy).

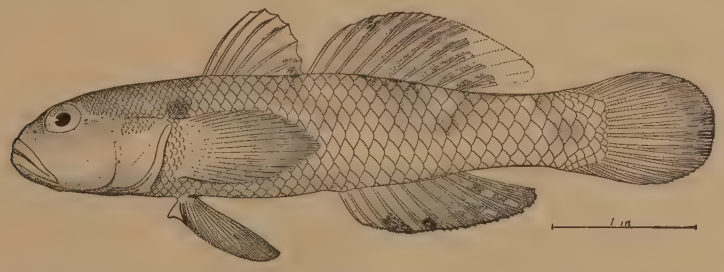


FIG. 50. *Ctenogobius bernadoui* (Jordan & Starks). (Proc. U. S. N. M., Vol. XXVIII, p. 207.)

211. **Ctenogobius similis** Gill. (Plate X, fig. 3.)
Tsushima (Jouy).

212. **Ctenogobius hadropterus** (Jordan & Snyder). (Korean "Sangukuguki.")
Suigen; numerous small specimens which seem to be identical with this Japanese species (No. 4116a–d).

213. **Aboma tsushimæ** Jordan & Fowler.
Tsushima (Jouy).

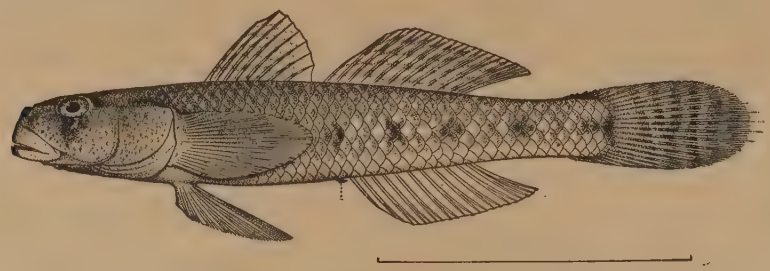


Fig. 51. *Aboma tsushimæ* Jordan & Fowler. (Proc. U. S. N. M., Vol. XXV, p. 575.)

214. **Chænogobius macrognathus** (Bleeker).
Gensan (Jouy).

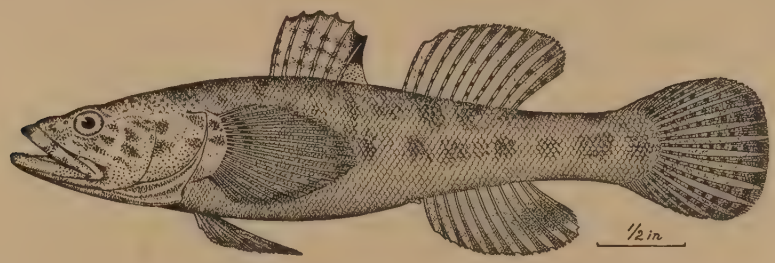


Fig. 52. *Chænogobius macrognathus* (Bleeker). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIV, p. 77.)

215. **Chlœa sarchynnis** Jordan & Snyder.
Gensan (Jouy).

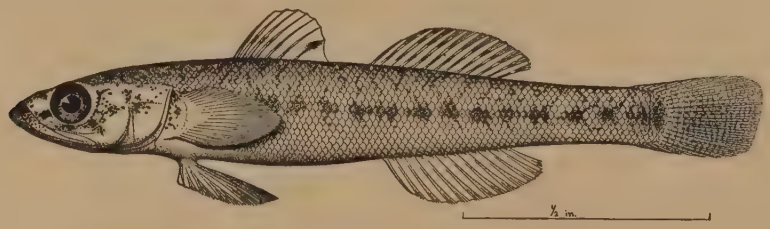


Fig. 53. *Chlœa sarchynnis* Jordan & Snyder. (Proc. U. S. N. M., Vol. XXIV, p. 83.)

216. **Pterogobius elapoides** (Günther).
Korea (Jouy).

Pterogobius daimio Jordan & Snyder seems to be the southern representative of this handsome species.

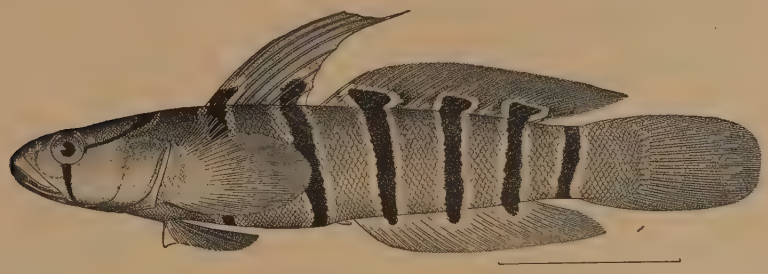


FIG. 54. *Pterogobius elapoides* (Günther). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIV, p. 92.)

217. **Chasmichthys gulosus** (Sauvage). (Plate X, fig. 2).
Chasmias misakius Jordan & Snyder.
Fusan; Gensan (Jouy).

218. **Chasmichthys dolichognathus** (Hilgendorf).
Korea (Jouy).

FIG. 55. *Chasmichthys dolichognathus* (Hilgendorf). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIV, p. 85.)

219. **Acanthogobius flavimanus** (Temminck & Schlegel). "Haze."
Fusan (No. 4534a–e); excessively abundant; Tsushima (Jouy).

220. **Acanthogobius hasta** (Temminck & Schlegel).
Chemulpo (Jouy).

221. **Acanthogobius stigmathonus** (Richardson).
Fusan (Jouy).

222. **Chæturichthys stigmatius** (Richardson).
Tsushima (Jouy).

223. **Tridentiger obscurus** (Temminck & Schlegel).
Gensan; Chemulpo (Jouy).

224. **Tridentiger bifasciatus** Steindachner.
Gensan; Fusan (Jouy).

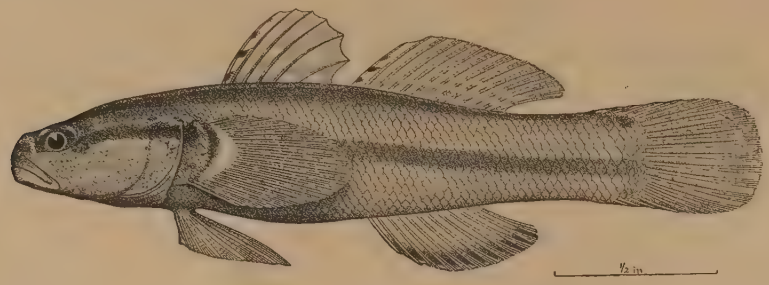


Fig. 56. *Tridentiger bifasciatus* Steindachner. (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXIV, p. 118.)

225. **Ranulina fimbriidens** Jordan & Starks.
Port Arthur (Abbott).

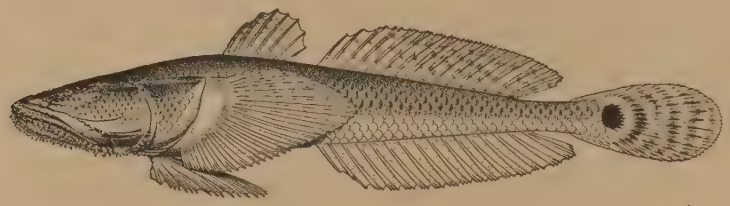


Fig. 57. *Ranulina fimbriidens* Jordan & Starks. (Proc. U. S. N. M., Vol. XXXI, p. 523.)

226. **Tænioides abbotti** Jordan & Starks.
Port Arthur (Abbott).

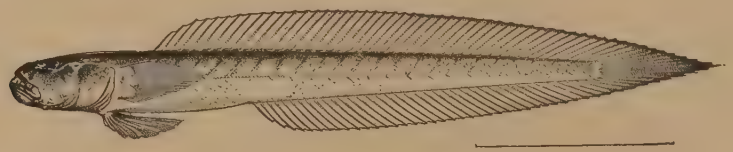


Fig. 58. *Tænioides abbotti* Jordan & Starks. (Proc. U. S. N. M., Vol. XXXI, p. 524.)

Family CALLIONYMIDÆ.

227. **Callionymus valenciennesi** (Temminck & Schlegel).
Market of Fusan.

FIG. 59. *Callionymus valenciennesi* Schlegel. (After Jordan & Fowler, Proc. U. S. N. M., Vol. XXV, p. 951.)

Family PLEURONECTIDÆ.

228. **Paralichthys coreanicus** Schmidt. "Hirame."
Fusan (No. 4480a), Port Arthur, Gensan (Schmidt).

229. **Paralichthys percocephalus** (Basilewsky).
Off Peking.
This seems to be the same as *Paralichthys swinhonis* Günther, from Chifu. We have not seen it.

230. **Verasper variegatus** (Temminck & Schlegel). "Hoshikarei."
Fusan (No. 4533a–d), Port Arthur.

231. **Verasper moseri** Jordan & Gilbert.
Chinnampo (No. 4229a).

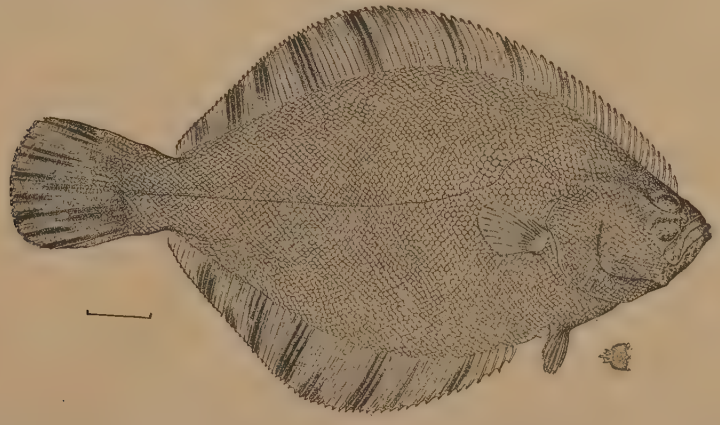


FIG. 60. *Verasper moseri* Jordan & Gilbert. (After Jordan & Starks, Proc. U. S. N. M., Vol. XXXI, p. 186.)

This specimen has the rather high arch of the lateral line of *Verasper moseri*, but the large spots on dorsal and anal approach *Verasper variegatus*. It may be that the two intergrade, *Verasper moseri* being the northern form.

232. **Protopsetta herzensteini** (Schmidt).
Port Arthur (Abbott).

233. **Platichthys stellatus** (Pallas).
Gensan (Jouy).

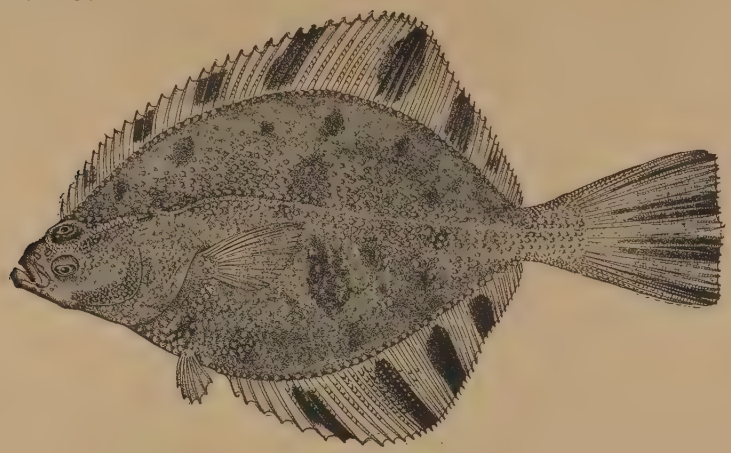


Fig. 61. *Platichthys stellatus* (Pallas). (After Jordan & Starks, Proc. U. S. N. M., Vol. XXXI, p. 219.)

234. **Kareius bicoloratus** (Basilewsky).
(*Pleuronectes scutifer* Steindachner.)
Gensan (Jouy); Gulf of Pechili (Basilewsky); Port Arthur.

235. **Pleuronichthys cornutus** Temminck & Schlegel. "Meitakarei."
Fusan (No. 4506a–b).

236. **Liopsetta obscura** (Herzenstein).
Chemulpo (Schmidt); Gensan.

237. **Lepidopsetta bilineata** (Ayres).
Gensan.

238. **Limanda yokahamæ** Günther.
Fusan, Port Arthur ("Korea" 4517a).

Family SOLEIDÆ.

239. **Zebrias fasciatus** (Basilewsky). (Plate IX, fig. 2.)
Solea fasciata Basilewsky, *Ichthyographia Chinæ Borealis*, p. 261. Shan-Dun.
Fusan (Basilewsky).

FIG. 62. *Lepidopsetta bilineata* (Ayres). (After Jordan & Starks, Proc. U. S. N. M., Vol. XXXI, p. 202.)

The following description is from two specimens (No. 4514), the larger 29 cm. in length, taken by Dr. Jordan in the market at Fusan, where the species is common:

Eyes and color on the right side; D. 83; A. 74; caudal 16; scales from above gill-opening to base of caudal 118, above lateral line 35, below 42, series across head between upper edge of gill-opening and upper eye 28, between gill-opening and lower eye 24. Body long, ovate-lanceolate; seventeen dark cross bars on eyed side behind head, all but the first arranged in pairs; head with six cross bands, also in pairs; eye small, 6–7 in head, nearly twice interorbital space. Measurements in hundredths of total length: Head 15; depth 39; snout 4; lower eye to gill opening 9.7. Mouth small, cleft to anterior third of lower eye, which is almost in contact with it; upper eye slightly in advance of lower; no rostral hook; scales all roughly ctenoid, those of anterior part of blind side provided with fleshy flaps, or papillæ; fins scaled nearly to tips.

Ground-color pale, broken on eyed side with dark cross-bands as mentioned above; dorsal and anal with continuations of markings of body on eyed side, margined with black.

The cross-bands of this species are typically arranged in pairs, of which there are 12 between snout and caudal. Some of them, however, may be so joined as to make a pair look like a single band, especially near the pectoral fin.

The larger number of fin-rays and scales distinguish this species from any other of the genus. In appearance it is not distinguishable from *Zebrias zebrinus* of Southern Japan and China. The two are clearly "geminate species," the northern form being *Zebrias fasciatus*, with an increased number of fin-rays.

240. **Areliscus hollandi** sp. nov. (Plate IX, fig. 3.) "Ushinoshita."

Type No. 4369, 365 mm. Fusan, Korea.

Eyes and color on left side; three lateral lines on the eyed side, one on the blind; no fringe on lips; gill-rakers obsolete; D. 128; A. 100; caudal 8 to 10; scales in lateral line from above gill-opening to base of caudal 112; scales above middle of upper lateral line 7; between upper and median lines 18–19, between median and lower 19–20, below lower line 7–8; series between lower eye and gill-opening 21–22.

Body very long, slender, lanceolate; mouth small; no rostral hook (in our specimen); maxillary extending beyond lower eye; villiform teeth on blind side of jaws; eye small, 12 in head, equal to interorbital space; nostrils two, one between eyes, the other near mouth before lower eye; scales of both sides strongly ctenoid, except on the upper part of head on blind side, where they are embedded; fins not scaled.

Measurements in hundredths of body length: Head 18; depth 26; snout from upper eye 6.5; lower eye to gill-opening 10.

Color white on blind side, dull olive-brown on eyed side; no markings; fins similar to body color; posteriorly dark on eyed side.

Described from the type 365 mm. long, taken at Fusan, Korea, by Dr. Jordan. It is named for Dr. William J. Holland. It is No. 4369a in the Catalog of the Carnegie Museum.

The accompanying figure is not absolutely accurate in respect to dorsal and anal fin-rays, which are correctly counted above.

241. **Areliscus abbreviatus** (Gray). "Shitabarame."

Description of a specimen 360 mm. long from Fusan, Korea. (No. 4358a.) Color on left side; D. 114; A. 90; caudal 10; scales from above gill-opening to caudal 118; above middle of upper lateral line 9 or 10; between upper and middle lines 22; between median and lower line 20; below lower line 9 or 10; about 24 series of scales between lower eye and upper part of gill-opening. Body very long, lanceolate; posterior two-thirds tapering gradually; lateral lines three on eyed side; fins not scaled; mouth small, rostral hook well developed, ending in advance of lower eye; eyes small, 13 in head, equal to interorbital, upper slightly in advance of lower; nostrils prominent, one between eyes, the other near cleft of mouth in front of lower eye; maxillary extending beyond lower eye; no fringe or cirrhi on lips. Measurements in hundredths of body length: Head 23; depth 27; snout from upper eye 8; lower eye to gill-opening 12. Scales of eyed side roughly ctenoid, those of blind side cycloid or

very slightly ctenoid, small, entirely embedded in skin on upper part of head, somewhat imbedded on rest of blind side.

Color white on blind side, uniform dull olive-brown on eyed side; no markings.

This species may be readily distinguished from *Areliscus semilævis* by the smaller number of scales, and from *A. purpureomaculatus* by the smaller number of fin-rays. The species called *Achirus plagusia* by Basilewsky (*Ichthyographia Chinæ Borealis*, p. 245), from the Gulf of Pechili, is some *Areliscus* or *Cynoglossus*, but the species cannot be determined.

242. **Areliscus rhomaleus** Jordan & Starks.
Port Arthur (Abbott).

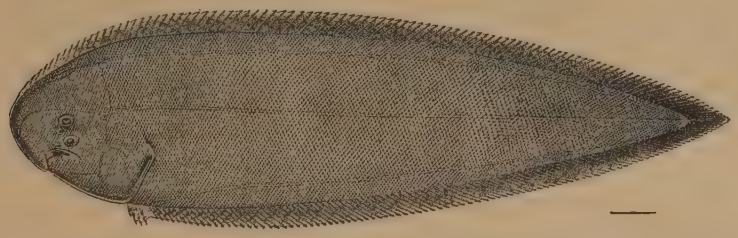


FIG. 63. *Areliscus rhomaleus* Jordan & Starks. (Proc. U. S. N. M., Vol. XXI, p. 526.)

Family BLENNIIDÆ.

243. **Zoarchias aculeatus** (Basilewsky).
Ophidium aculeatum Basilewsky, *Ichthyographia Chinæ Borealis*, p. 248. Sea off Peking.

The name *Ophidium aculeatum* is applied by Basilewsky to some blennoid fish without ventrals, with concealed scales, with 32 stiff, short, dorsal spines, with the dorsal and anal united around the tail, the mouth large, without barbels, and cleft to the eyes. The body is gray with black spots and points, the lateral line straight, spotted; length of fish 8 inches. This species must be one of the Eulophiine blennies and near the genus *Zoarchias*. *Zoarchias veneficus* has 28 dorsal spines.

244. **Dictyosoma temmincki** Bleeker.
Tsushima (Jouy).

245. **Enedrias nebulosus** (Temminck & Schlegel).
(Native name "Ginbo.")
Tsushima (Jouy); Fusan, common (No. 4244a); Gensan.

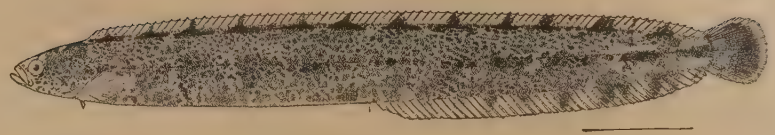


FIG. 64. *Enedrias nebulosus* (Schlegel). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXV, p. 469.)

246. **Pholis taczanowskii** (Steindachner).
Gensan, Fusan (Jouy).

247. **Dinogunnellus grigorjewi** (Herzenstein).
Chinnampo, a fine specimen, No. 4379a.

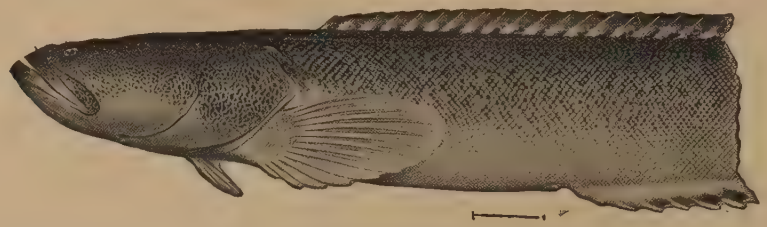


FIG. 65. *Dinogunnellus grigorjewi* (Herzenstein). (After Jordan & Snyder, Proc. U. S. N. M., Vol. XXV, p. 497.)

Family LYCODIDÆ.

248. **Enchelyopus gilli** (Jordan & Starks).
Fusan (Jouy).

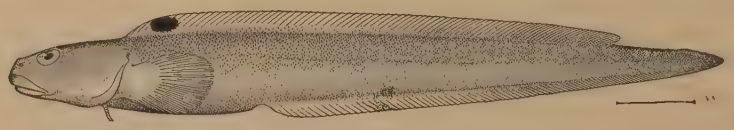


FIG. 66. *Enchelyopus gilli* (Jordan & Starks). (Proc. U. S. N. M., Vol. XXVIII, p. 212.)

Family GADIDÆ.

249. **Pollachius brandti** (Hilgendorf).
(Native name "Suketo-dara.")
Fusan (No. 4367a), one specimen filled with eggs. A soft-bodied fish, apparently from deep water. Head 4 in length; depth 6.5; eye 4 in head; snout 3.33; D. 12, 14, 19; A. 19, 19.

250. **Eleginus navaga** (Koelreuter).
Chemulpo (Schmidt); Chinnampo (No. 4200a and 4188a–b).

251. **Gadus macrocephalus** Tilesius.
Chinnampo (No. 4378a); Port Arthur (Abbott).

Family LOPHIIDÆ.

253. **Lophius litulon** (Jordan & Sindo).
Seen in the Fusan Museum.

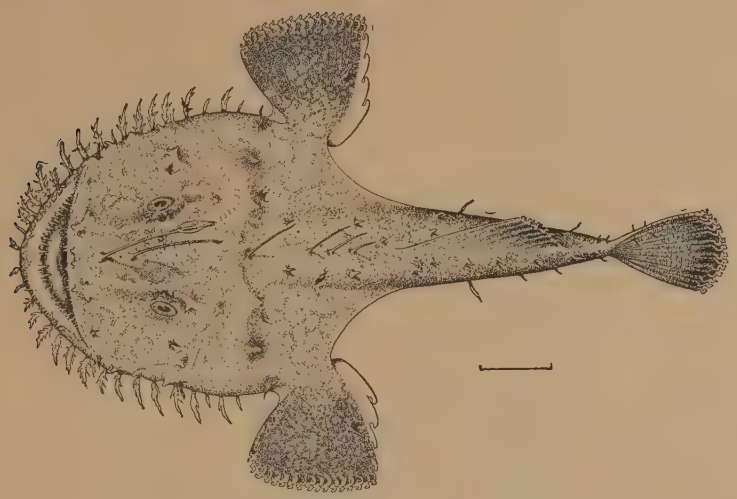


FIG. 67. *Lophius litulon* (Jordan & Sindo). (Proc. U. S. N. M., Vol. XXIV, p. 365.)

254. **Lophiomus setigerus** (Vahl).
Seen in the Fusan Museum.

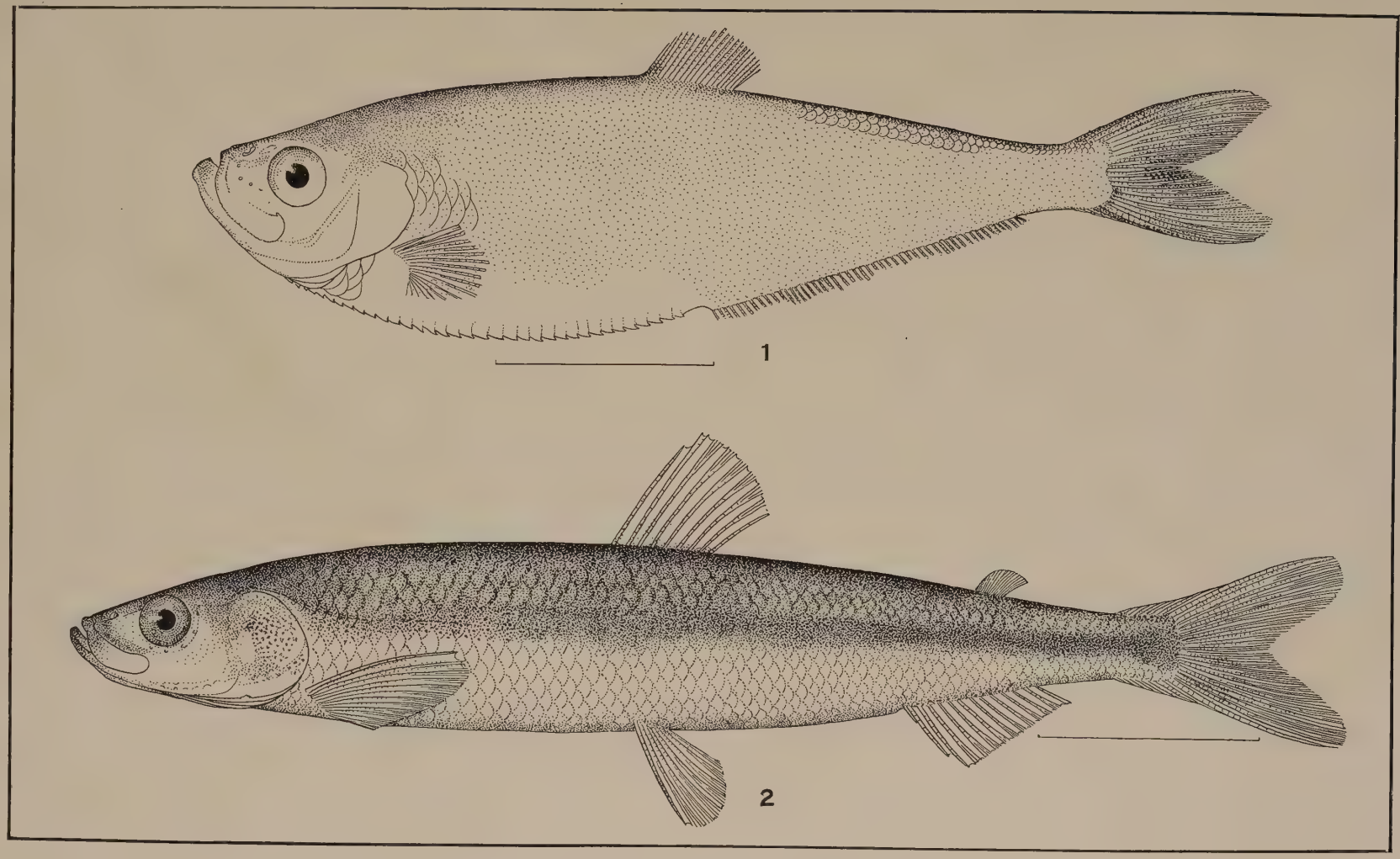


FIG. 1. *Zunasia chinensis* (BASILEWSKY). 5 in. C. M. Cat. No. 4569.
FIG. 2. *Spirinchus verecundus* JORDAN & METZ. (Type.) 5.75 in. C. M. Cat. No. 4570.

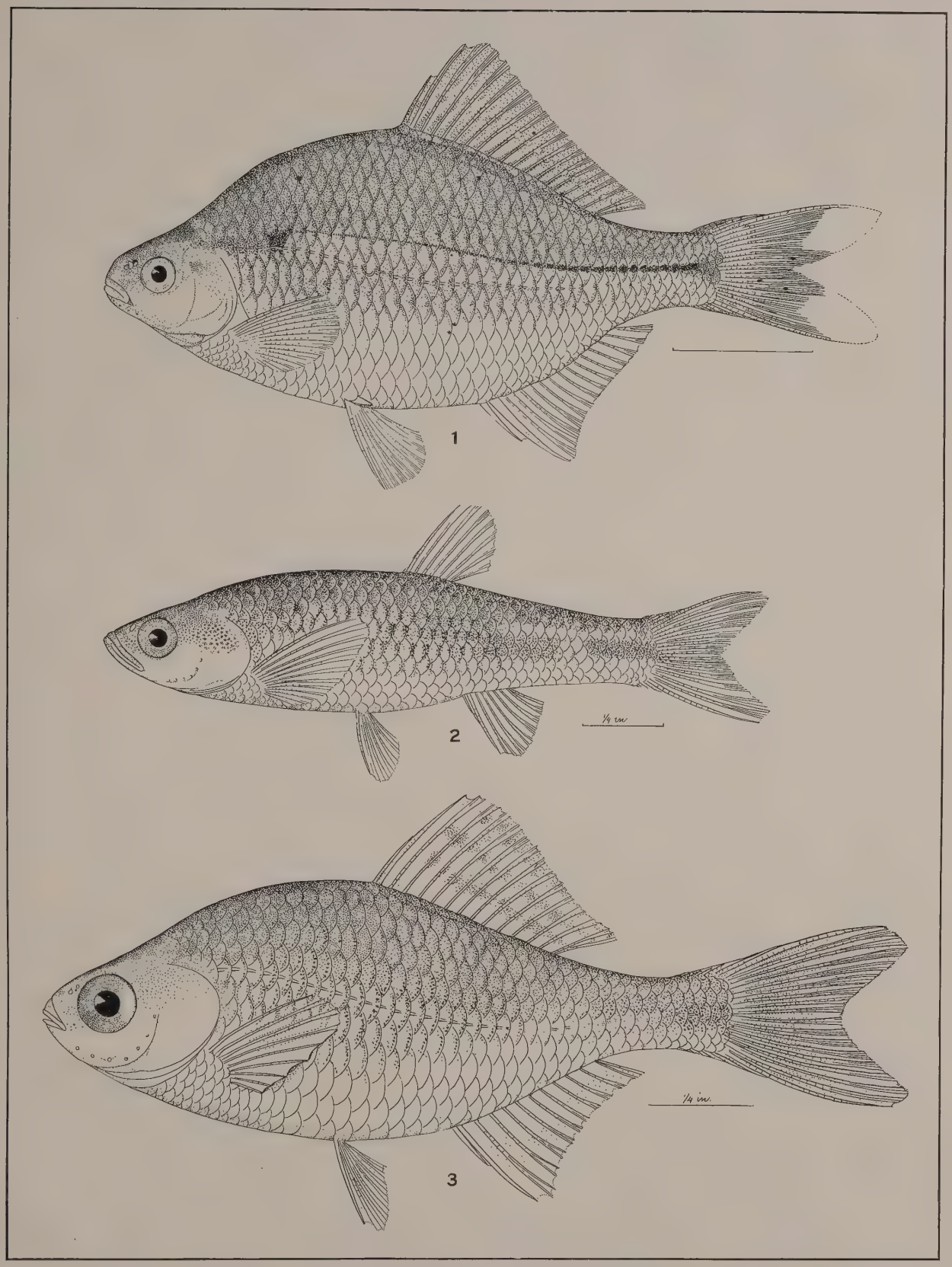


FIG. 1. *Acanthorhodeus asmussi* BERG. 5.5 in. C. M. Cat. No. 4571.
FIG. 2. *Rhodeus chosenicus* JORDAN & METZ. (Type.) 2 in. C. M. Cat. No. 4567.
FIG. 3. *Pseudoperilampus hondæ* JORDAN & METZ. (Type.) 2 in. C. M. Cat. No. 4566.

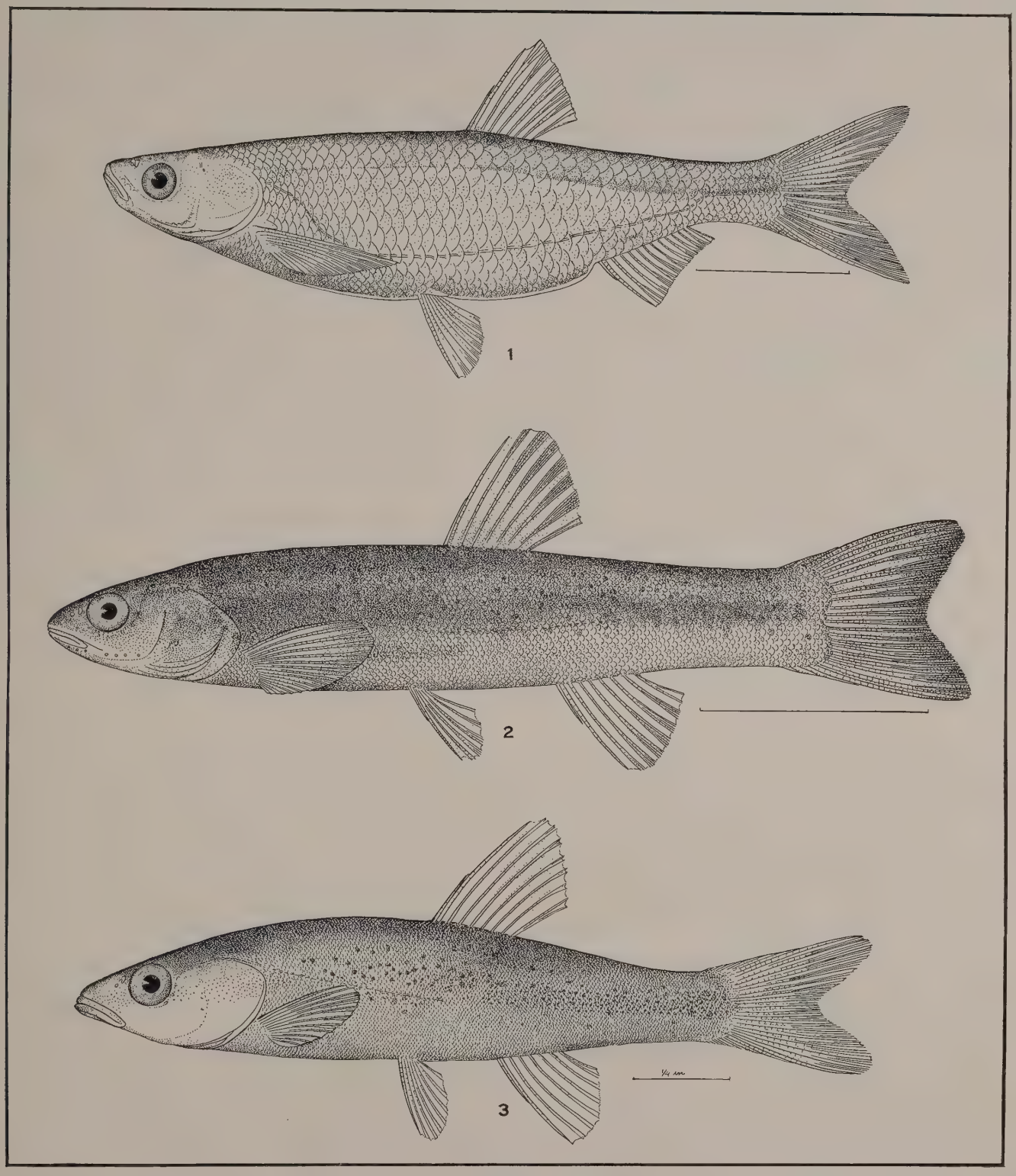
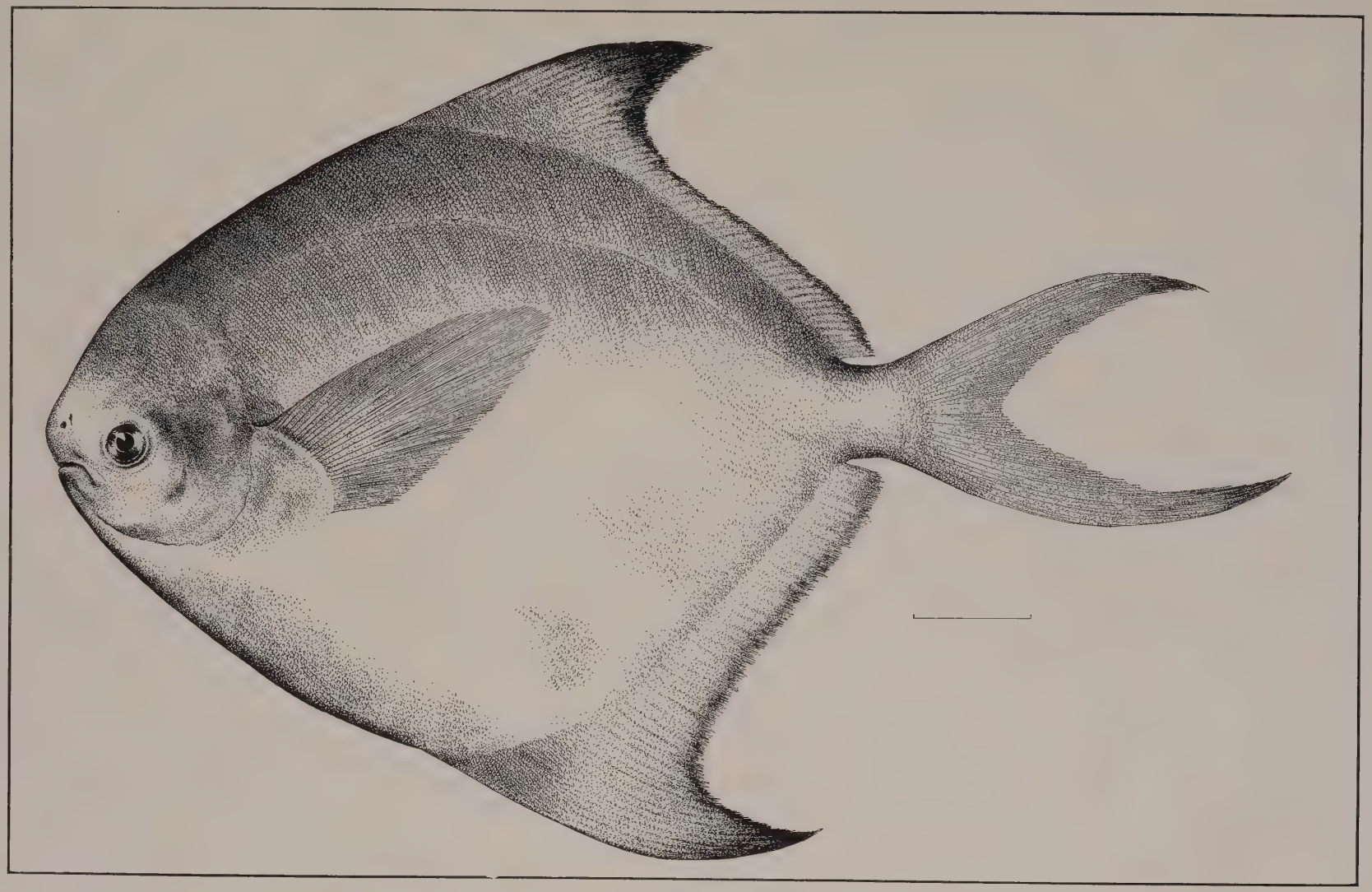
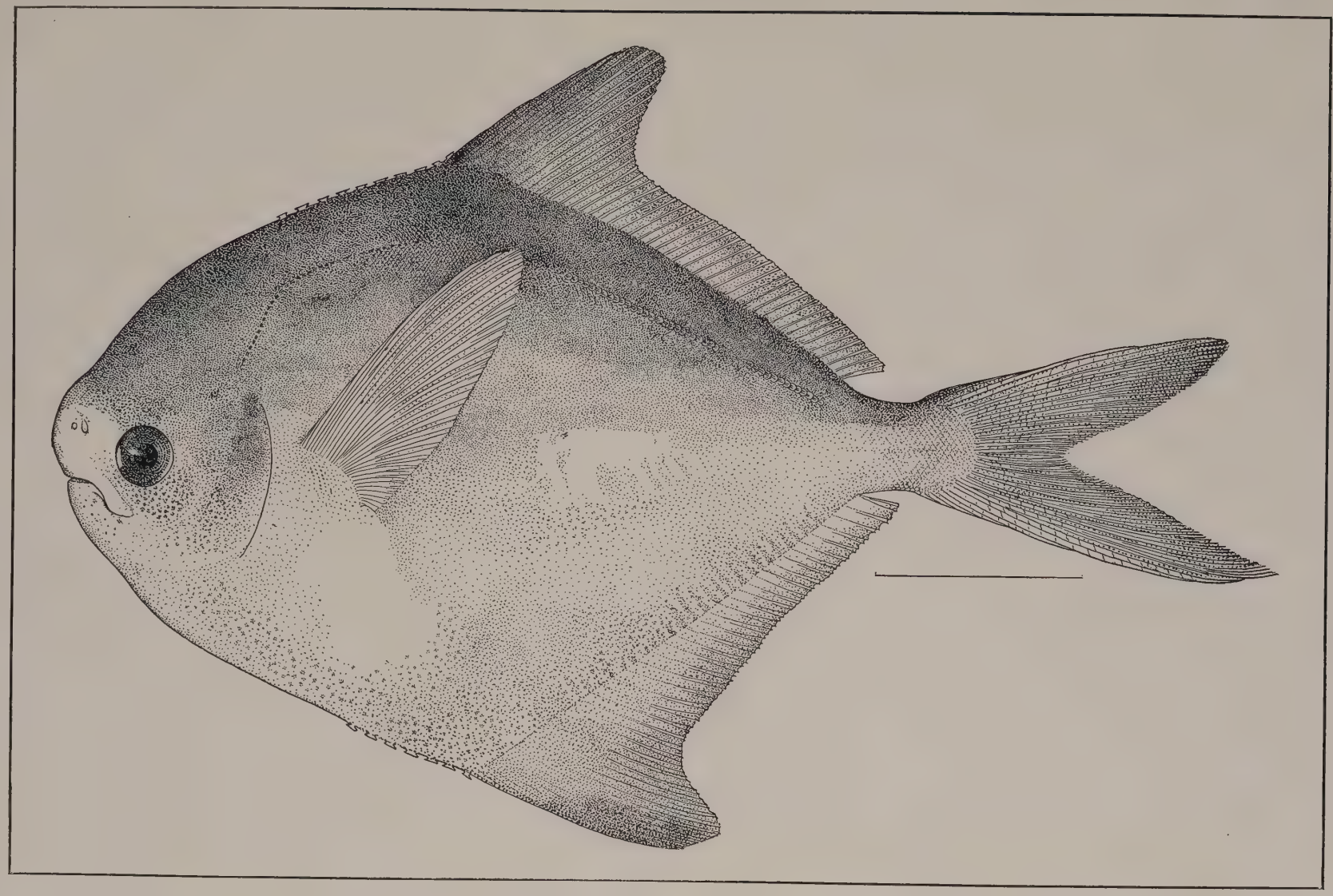


FIG. 1. *Parapelecus eigenmanni* JORDAN & METZ. (Type.) 5.5 in. C. M. Cat. No. 4565.
FIG. 2. *Pseudaspius bergi* JORDAN & METZ. (Type.) 4 in. C. M. Cat. No. 4563.
FIG. 3. *Pseudaspius modestus* JORDAN & METZ. (Type.) 2 in. C. M. Cat. No. 4560.



Stromateoides argenteus (EUPHRASEN). 10.5 in. C. M. Cat. No. 4117.



Stromateoides echinogaster (BASILEWSKY). 5.75 in. C. M. Cat. No. 4572.

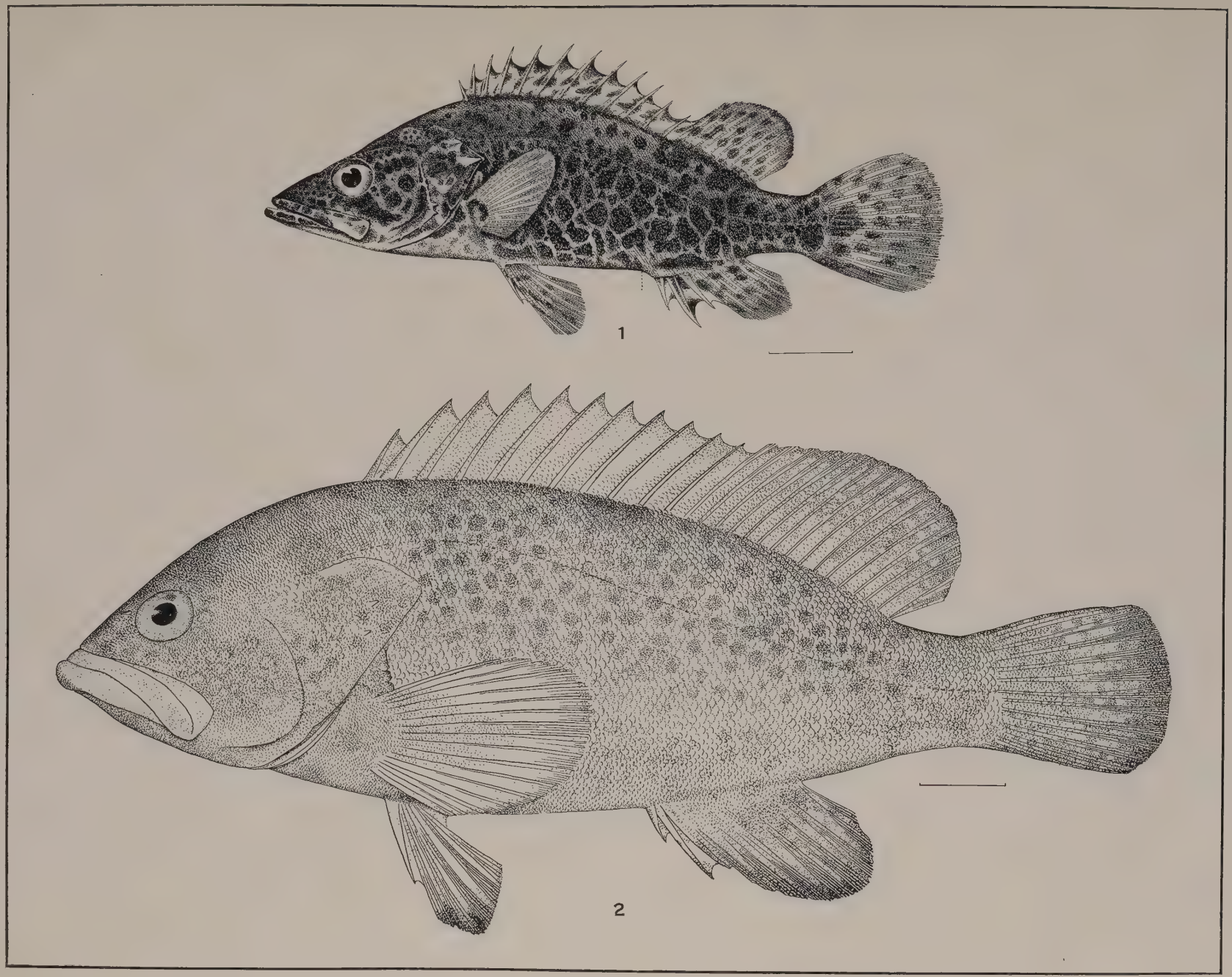


FIG. 1. *Siniperca scherzeri* STEINDACHNER. 8 in. C. M. Cat. No. 4173.
FIG. 2. *Epinephelus ionthas* JORDAN & METZ. 13 in. C. M. Cat. No. 4559.

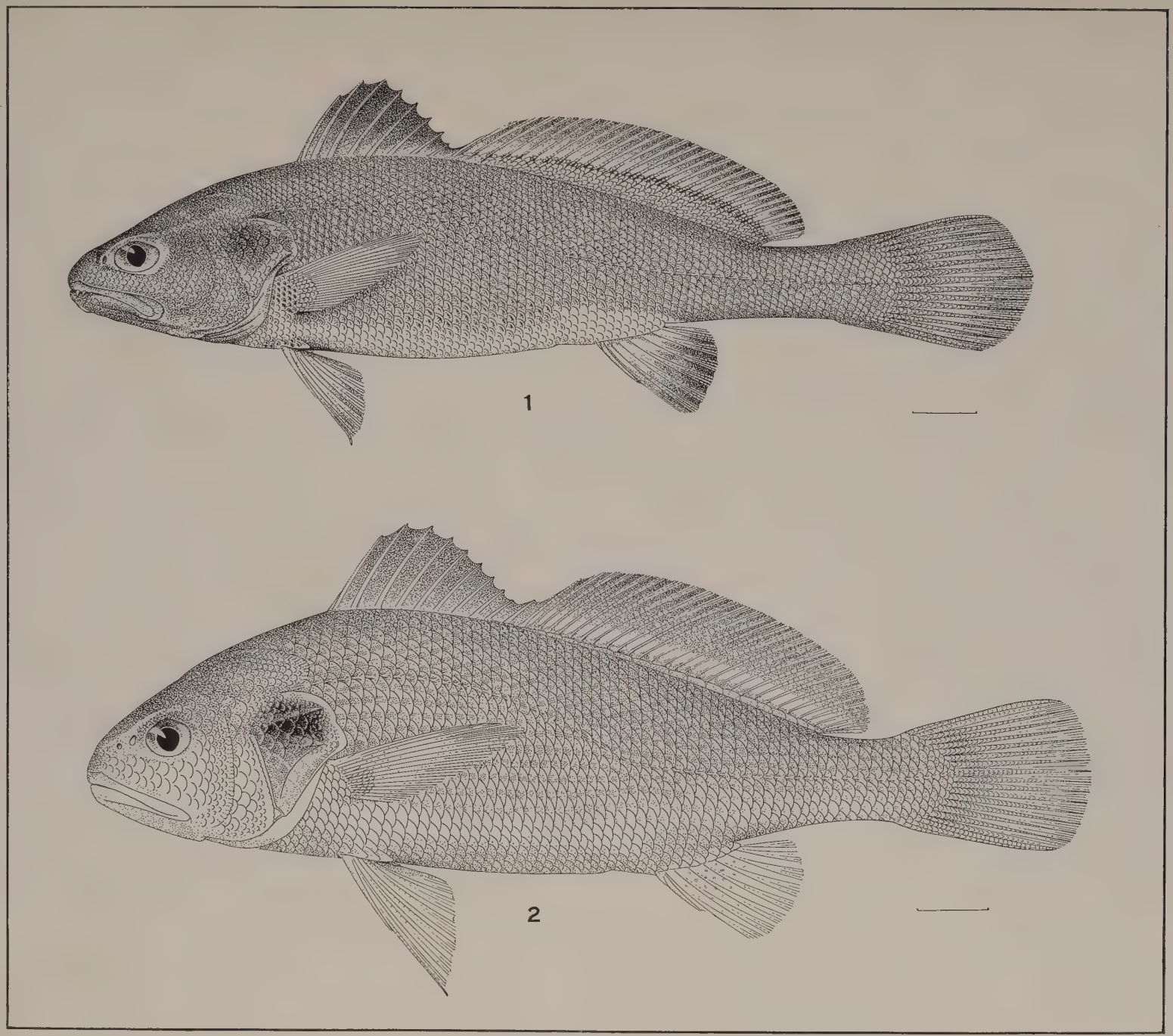


FIG. 1. *Sciæna japonica* (TEMMINCK & SCHLEGEL). 15.25 in. C. M. Cat. No. 4581.
FIG. 2. *Sciæna iharæ* JORDAN & METZ. (Type.) 14 in. C. M. Cat. No. 4371.

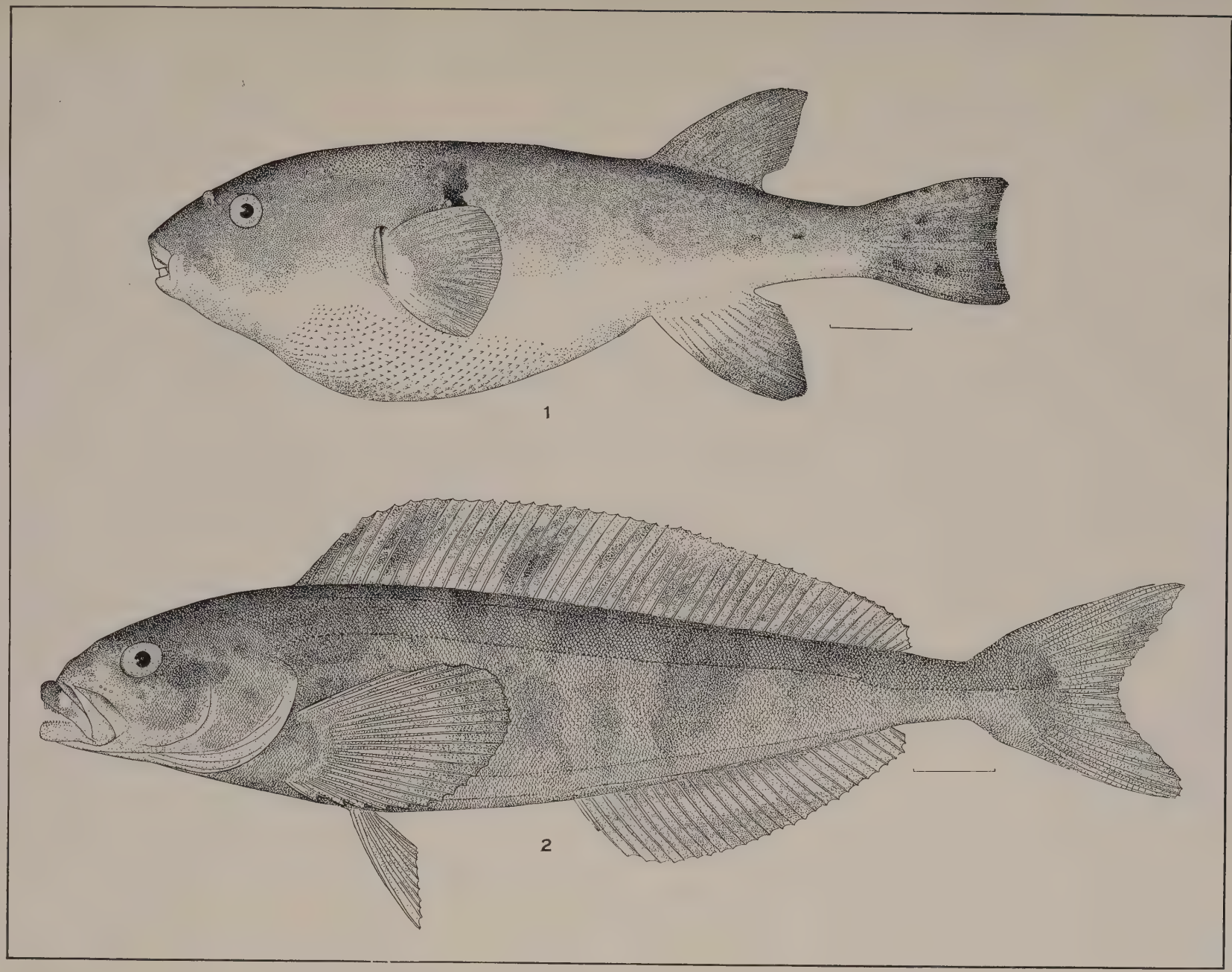


FIG. 1. *Spheroides basilewskianus* (BASILEWSKY). 9.75 in. C. M. Cat. No. 4573.
FIG. 2. *Pleurogrammus azonus* JORDAN & METZ. (Type.) 14 in. C. M. Cat. No. 4558.

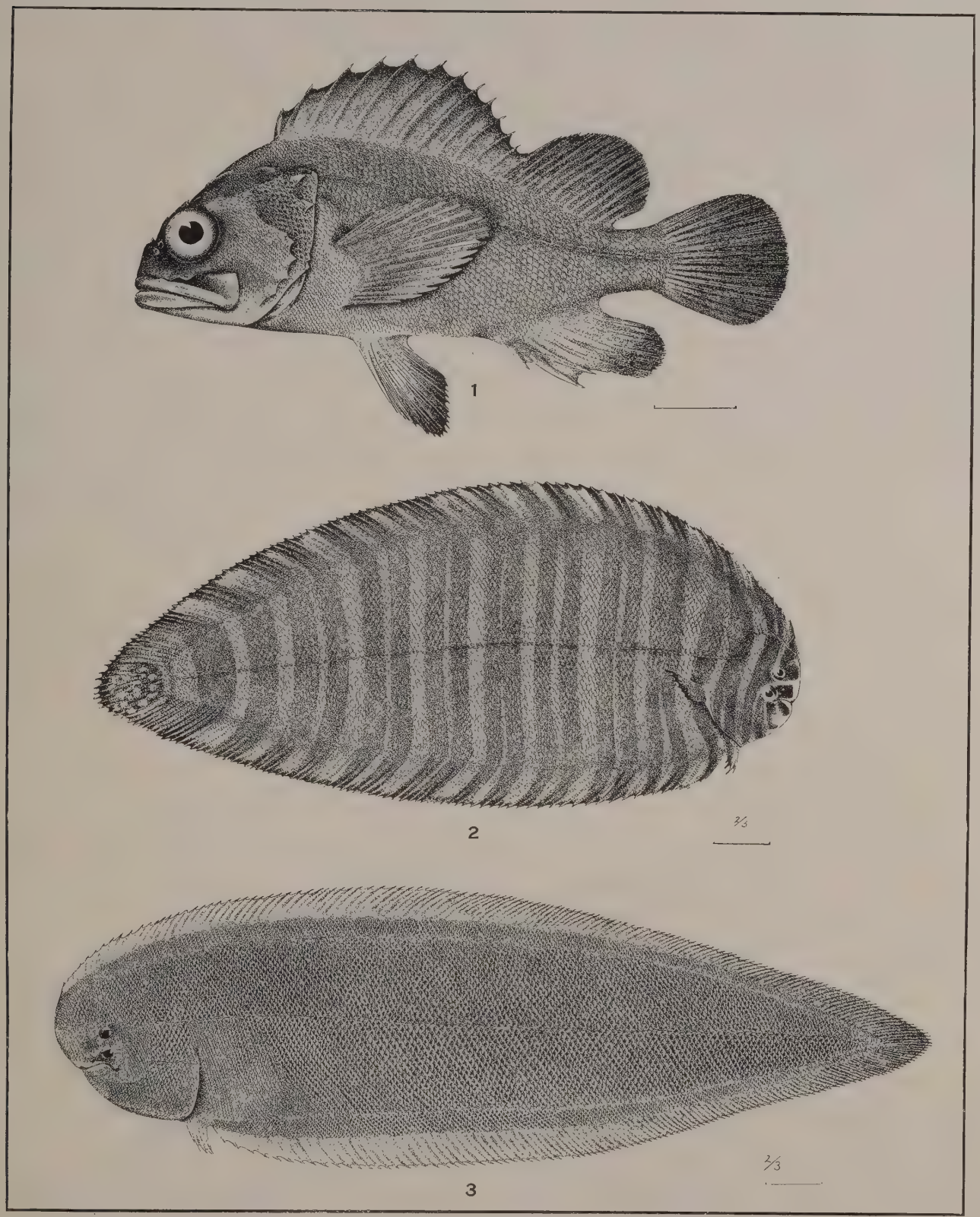


FIG. 1. *Sebastodes ijimæ* JORDAN & METZ. (Type.) 6.25 in. C. M. Cat. No. 4172.
FIG. 2. *Zebrias fasciatus* (BASILEWSKY). 7.8 in. C. M. Cat. No. 4574.
FIG. 3. *Areliscus hollandi* JORDAN & METZ. 14.75 in. C. M. Cat. No. 4369.

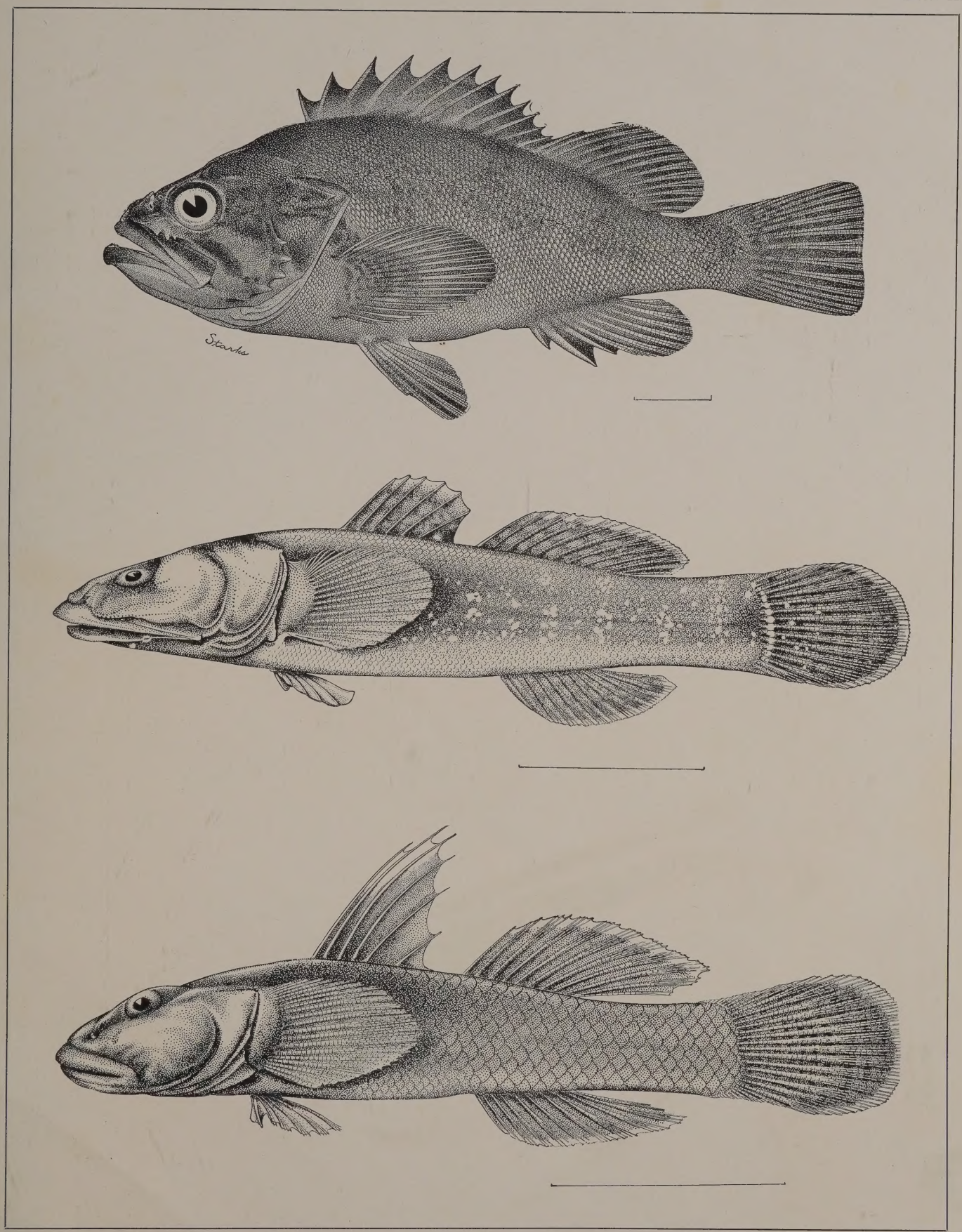


FIG. 1. *Sebastodes schlegeli* (HILGENDORF). After JORDAN & STARKS, Proc. U. S. N. M., Vol. XXVII, Pl. II.
FIG. 2. *Chasmichthys gulosus* (SAUVAGE). After JORDAN & SNYDER, Proc. U. S. N. M., Vol. XXIII, Pl. XXXVI.
FIG. 3. *Ctenogobius similis* (GILL). After JORDAN & SNYDER, Proc. U. S. N. M., Vol. XXIII, Pl. XXXV.